

# COMMERCIAL CAR JOURNAL

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## EDITORIAL CONTENTS

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### FEATURE ARTICLES

|   |    |
|---|----|
| Ruinous Trucking Practices Must Be Cleaned Up..                               | 10 |
| Rate Regulation Basis Must Be on Trucking Costs..                             | 11 |
| Codes Hold Big Change for the Motor Truck Industry                            | 12 |
| Brake Capacities May Be Rated to Promote Highway Safety .....                 | 14 |
| Buying the Right Truck Should Not Be a Game of Chance .....                   | 15 |
| How to Select Gasoline to Effect Economy.....                                 | 17 |
| Operators Must Hit 4 Marks to Prolong Engine Life                             | 18 |
| Oil Changing is Just a Bugaboo With a Costly Trail                            | 19 |
| Legal Limits Put Larger Loads Up to Designers..                               | 21 |
| Air Cleaners of the Oil-Bath Type Are Favored for Very Dusty Conditions ..... | 24 |
| What's the Economic Life of a Truck? .....                                    | 28 |
| Tricks With the Welding Torch That Save Money on Motor Trucks .....           | 30 |
| Straight Steers on Adjustment of Ross Steering Gears                          | 34 |

### NEW PRODUCT DESCRIPTION

|  |    |
|--|----|
| Novel Design Ideas in New Curtis-Bill Truck.....             | 36 |
| Hercules Diesel is Wet Sleeve Type With 188-Hp. Rating ..... | 37 |
| White K Models Shift More Load to Front .....                | 38 |
| Two New Fuller Five-Speeds .....                             | 38 |
| GMT Modifications .....                                      | 40 |

### DEPARTMENTS

|   |    |
|---|----|
| After Hours—Codes and Chiselers.....        | 9  |
| The Ear to the Ground Department.....       | 23 |
| Court Decisions in Truck Cases .....        | 26 |
| Salvage—From a Shop Man's Mail .....        | 27 |
| Post Scripts .....                          | 33 |
| News of the Industry .....                  | 39 |
| Commercial Car Journal Specifications ..... | 42 |
| Advertisers' Index .....                    | 62 |

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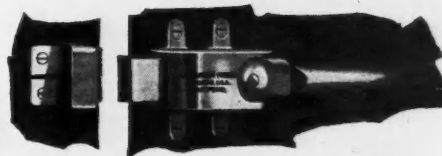
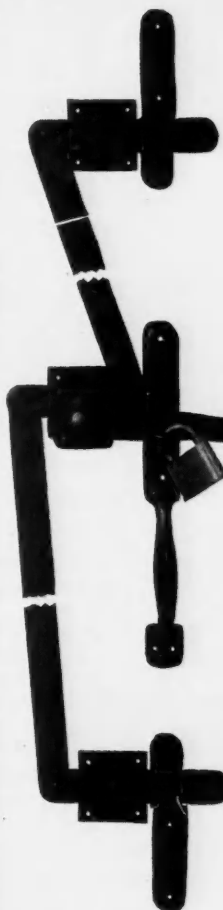


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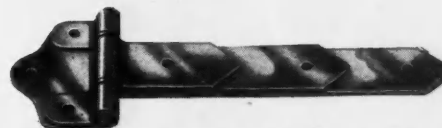
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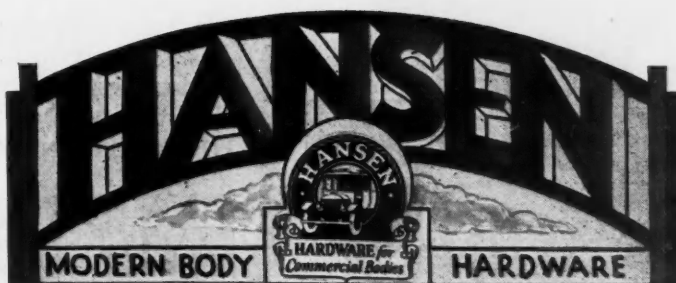


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ALCOA ALUMINUM

# CODES AND CHISELERS



**T**HE codes that have been submitted to the National Recovery Administration by the trade and operator branches of the motor truck industry fulfill the highest hopes and the sweetest dreams of the most rabid idealists. If they are approved and rigidly enforced they will effect desirable reforms and result in a stability of business such as these branches of the truck industry have never before experienced.

We have no way of telling just what changes may be made to the automotive retail code before it is finally approved. But we do know that if the final form of the code is essentially the same as the latest revised draft, its effect will be to place the greatest premium in history on downright intelligent salesmanship.

The retail code aims straight at the elimination of the evil practices which during the last several arduous years have given birth to a species of salesman known as "chiseler." So, with the elimination of such unfair competitive practices as excessive trade-in allowances, over-liberal terms, generous discounts, commission splitting and the like, will come the end of the chiseler, and real salesmanship—salesmanship worthy of the name—will at last come into its own.

The retail truck trade, as we all know, has had a generous share of chiselers and of their spineless substitutes for honest selling. It may be argued in excuse that the causes of this condition come from without. But there is no sense in blaming the buyer for one's own weakness. The causes definitely lay within the trade itself, but only determined group action could get rid of them. The NRA program made group action compulsory and provided the incentive for correcting all those evils which started as isolated faults of individuals, but which gradually were becoming the set habits of the herd.

There is no doubt that the government will encourage the automotive retail trade and truck operators in their praiseworthy desire to get rid of all unfair practices. But actual emancipation from the evils will be for the trade and operators to accomplish themselves. If they want to be free—if they want decent profits—they

will live up to every provision in the codes.

The only alternative will be to chisel the codes. And that would be the worst evil of all.

## A NEW ALIBI

**I**N the trade we foresee a tough time ahead for sales managers. Among other things they will be subjected to a new alibi. The loss of a lot of sales will be attributed by weak salesmen to code evasion.

The only way for them to prevent salesmanship from degenerating into a 50-50 proposition—50 per cent selling and 50 per cent spying—is to strengthen the salesmen and insist upon strict adherence to every code provision.

## POLITICS

**A**Doption of a code applying to motor truck operators is now being delayed because of association difficulties. Two codes have been submitted: one by the Federated Truck Associations of America applying to all types of operators, and the other by the American Highway Freight Association, applying to for-hire operators.

It is not likely that both codes will be accepted by NRA. Conferences now being held and the final hearing, expected within two or three weeks, will serve the purpose of reconciling whatever differences may exist.

At the moment the inability to reconcile differences is political. Since both associations are striving to assert them-

selves as being truly representative of the highway hauling industry, neither one is willing to make concessions to the other.

This maneuvering may be considered temporary. Eventually one will gain recognition as the code administrator and the other will have to conform. The only way this recognition can come about is for the two groups to merge or for one association to prove conclusively that it possesses the greater strength.

Although a merger is considered unlikely by some, others—among whom this writer is numbered—believe that to insure future harmonious action a merger is the logical move. Following this the resulting national association should establish divisions for each of the different types of truck operators. A vice-president should head up each division which would be free to deal with its own specific problems. The parent organization should have a governing board representing all divisions which would reconcile differences arising between divisions and speak with one deafening voice on matters affecting all truck operators.

Such an arrangement would eliminate the American Highway Freight Association as a name. But it would not eliminate its representation nor its functions, both of which would be preserved in one of the membership divisions.

Reduced to this essential it becomes plain that any attempt to preserve a mere name must be actuated by a desire to serve personal ambitions rather than the common good.

One, strong national association of motor truck operators is absolutely necessary. In the New Deal the cards are not exactly stacked in favor of motor trucks. To insure fair play a national organization uniting all operators will be the best weapon.

This weapon can be used as a defense against legislative efforts inspired by prejudice, and as an offense to procure laws stabilizing and insuring the progress of highway transportation.

For the greatest effectiveness there must be unity.

## AFTER HOURS

EDITORIAL COMMENTS BY GEORGE T. HOOK, EDITOR





# RATE REGULATION BASIS MUST BE TRUCKING COST

By J. W. BLOOD, PRESIDENT

FEDERATED TRUCK ASSOCIATIONS OF AMERICA

● After the formation of the Federated Truck Associations of America and the American Highway Freight Association and the election of their officers, the *Commercial Car Journal* extended personal invitations to the presidents of both organizations to express themselves in its pages.

The invitations were accepted and the expressions are here published on opposite pages.

Regarding the presidents, personal references are in order.

Mr. Rodgers is a truck operator, operating under the firm name of Eshenbach & Rodgers. His operation, numbering about 50 trucks, radiates from Scranton, Pa. It is a for-hire operation handling freight solely for the Great Atlantic & Pacific Tea Co. Mr. Rodgers has been actively interested in association work and is at the present time president of the Pennsylvania Motor Truck Association.

Mr. Blood is an attorney-at-law, vice-president of Southern Kansas Stages, Inc., common carrier truck and bus line, member of the Kansas Legislature and has been active in truck association work in both Kansas and Oklahoma. As an association official and a member of the Legislature he has been an active truck partisan in state and Federal transportation investigations.

## The PRESIDENT'S PAGE

SEPTEMBER, 1933

THE truck industry is today one of the most important factors in our business life. Every business is dependent upon it. Practically every pound of freight moved, one or more times uses the truck from farm, mill, factory to railroad—or to store or home.

No industry has ever been subjected to regulations and taxes as has the truck. Property, tag taxes, gasoline taxes, public service commission or special road taxes, occupation taxes by states and cities and gasoline, sales and parts taxes by Federal government eat up over 10 per cent of its gross revenue. In addition, many states have imposed impractical load and length limits.

The commercial trucker wants and asks for proper safety regulations. He is willing to pay a reasonable tax for the use of the highway. He favors proper regulations as to service and rates. He, however, believes that his rates should be based on his own costs—and services performed—and should not be fixed on the basis of some other means of transportation or to drive his business to other channels.

The public, he believes, has an interest in the rates charged. To over-regulate him—or to fix a tariff which is not based on his own costs and services, will force the for-hire business into the hands of the private industrial trucker—and private industry does not care to

go into the transportation business, and if so forced the consuming public will pay the bill.

The truck industry, like the farmer, is slow to organize. Its uses are so varied, and its different classes so numerous that it is hard to weld it into one strong state or national organization that can meet its organized foes.

Persecution by confiscatory tax and regulatory laws is doing so.

The NRA will be a great incentive to organization of the industry. It is only through the organization of all the various units, common, contract, industrial and agricultural, that the industry can meet the problems it faces today. An industry which employs more men than any other industry except agriculture, cannot be denied its rights or privilege of employment.

The Federated Truck Associations of America represents all classes of carriers—public, contract and private—believes in strong state associations for every practical safety rule, for sane regulations not on the basis of saving some other transportation agency but based on its own cost of serving the public for a reasonable profit. It does not believe in doing business for less than cost. It has many problems to solve—and believes by cooperation it can solve those problems to its and the shipping public's satisfaction.

THE COMMERCIAL CAR JOURNAL





# RUINOUS TRUCKING PRACTICES MUST BE CLEANED UP

By TED RODGERS, PRESIDENT  
AMERICAN HIGHWAY FREIGHT ASSOCIATION

**T**HOUGH I am not in the least unmindful of the honor conferred on me through my election to the presidency of the American Highway Freight Association, I am prone to consider the office first and foremost as a great responsibility.

In accepting the presidency, I described myself as "just a plain ordinary trucker." I meant just that. I pledged my time and energy to the Association's task of uplifting our industry. I will keep my word.

As I stood at the speakers' table and gazed out over that large hall filled with directors, delegates, representatives and observers from all over the country I was gratified that the trucking industry at last had an organization befitting its size and importance. I was proud of the type and caliber of the men in attendance—just plain ordinary truckers—yet that group would have done credit to any business or profession.

As I made some rough mental calculations I realized that these men had traveled, in total, hundreds of thousands of miles from their homes. The total investment of the businesses in which these men are actively engaged would reach staggering figures. Naturally they are vitally interested in protecting an industry which in many cases represents their life's work, their livelihood, their all.

The American Highway Freight Association faces tremendous tasks. perplexing problems must be solved. Every phase of truck operation must be carefully considered in the light of its special conditions and peculiar problems. And each type of carrier must be protected: common, line-hauler, local

drayman and the industrial operator or business man who has come to consider the truck an indispensable tool of his business. All classifications must be equitably treated without undue advantages to any group.

Our codes and appendixes must uphold the spirit of NRA without jeopardizing motor truck owners. Federal regulation—when it comes—must be written in the public interest and must insure the proper development of commercial highway transportation on its own merits. My record in Pennsylvania leaves no doubt of where I stand on that subject.

The minimum wages set forth in the code relate to the lowest paid employee. These minimum wages affect a minority of the employees: the majority of the employees enjoy a much higher scale of remuneration.

The situation in this industry is rife with ruinous competitive rates and practices. The provision for rate agreement contained in the basic code is hoped to be the first step toward allowing to the industry itself, with the approval of the administration, facilities for eliminating these ruinous rates and practices.

Certain portions of this industry are required to publish tariffs in certain sections of the country. Stabilization in the industry can hardly be obtained without the opportunity for rate agreements below which charges would be in violation of the code.

While the charges and tariffs published in accordance with the terms of this code might be feared by some possibly to exceed a reasonable return for the services performed, there are so many methods by which similar services

could be obtained, and competing forms of transportation take the business, that it is practically impossible for the provisions of this code even to tend towards assurance that the rates will not be below cost of the service performed.

There has been definitely borne in mind the principle that this industry is entitled to compete on a basis of equality with the rail carriers. The maximum hours of labor included in the code are comparable, in general, to railway transportation employees' hours of labor. They are less for clerical employees. While it is believed that adoption of the code presented will mean an increase in the number of employees greatly beyond the number employed in 1929, perhaps totaling over one-half million additional men, we cannot believe that we would be justified in proposing maximum hours of labor less than those of our legitimate competitors.

The American Highway Freight Association must dedicate itself to the accomplishment of these ends.

I ask for the support of every director and delegate to the American Highway Freight Association. I solicit the cooperation of truck associations throughout the country. I request the help of each truck owner.

I shall need it if the efforts of the American Highway Freight Association are to be crowned with success. We must not fail.

The  
PRESIDENT'S PAGE

# CODES HOLD BIG CHANGE FOR

**Dealer, operator, trailer and repair codes strike at the Unfair Practices which have been acknowledged as the obstacles to profitable business**

**A**MID the feverish activity in NRA headquarters in Washington codes are being considered which will, if adopted, change every phase of the truck industry. Manufacturers of trucks and trailers have filed codes as have dealers and operators. This action was to be expected but it now appears that industries outside the field of motor transportation are submitting proposals bearing upon the subject. The cane sugar code, for illustration, provides that the price shall be refiner's price plus all-rail freight rate and that brokers and warehousemen must not own trucks. The steel and cement codes contain provisions which may be interpreted as hindering shipments by truck.

Within the industry the approval of labor exceptions to the President's Re-employment Agreement for the trucking industry by NRA on Aug. 23 gave truckers the opportunity to obtain the cherished and, according to many the vital, Blue Eagles. Meanwhile and still work goes on apace on more comprehensive and more permanent codes for various industries which come within the truck classification.

At the outset classification and definition became pressing problems. The writer, prior to a code session in Washington, felt quite capable of dashing off a definition of a for-hire trucker on a moment's notice. After listening to a group of operators for a few minutes he was not so sure and at the end of more than an hour he was ready to agree with a trucker who said, "Some of you men are doing things with trucks that I did not know existed."

The petroleum industry code includes gasoline stations, it is said that the code for car washing stations may be construed to apply to all establishments carrying on that function, many dealers maintain storage facilities and therefore are wondering about the garage code. The American Highway Freight Association filed a code for the for-hire truck operators and the Federated Truck Associations of America filed a code applicable to all truck operations. Trucks serving parent industries, manufacturing for illustration,

may elect to operate under the manufacturing code or the truck code. At least it is proposed to give this option.

Far-reaching in its scope and effects is the code for dealers submitted by the National Automobile Dealers Association. At one fell swoop it wipes out price cutting and chiseling. All motor vehicles are to be sold at factory list price, plus extra equipment at list price, plus an amount equal to freight, plus handling charge, plus taxes. Must be a catch somewhere? What about trade-ins?

Trade-ins have not been overlooked. On the contrary, this problem which has plagued dealers for so these many years is settled definitely, let the chips blow where they list. Trade-in allowances are restricted to the average price at which used vehicles of the particular make and type are selling in the trade territory minus (note the word well) at least 20 per cent minimum for selling, handling and reconditioning.

There is more. "The retail list price for parts, accessories and supplies shall be the manufacturer's published list price adjusted to include all taxes." And no dealer may sell parts at other than retail list price except to duly authorized dealers, sub-dealers or authorized service stations.

If you fail to find any special provisions for fleet discounts in these provisions you will not be alone. Whether the "authorized service stations" include independent repair shops or apply only to specialty shops, such as electrical equipment service, does not appear.

The N.A.D.A. code applies to truck dealers as well as to passenger car dealers and combination dealers. The status of exclusive truck dealers was not certain under the first copy of the N.A.D.A. code, but the revised code

leaves no doubt that truck dealers are included. A "dealer" includes any "individual, partnership, association, trust or corporation engaged in whole or in part in any phase of the business of motor vehicle retailing, and/or servicing and/or repairing new or used motor vehicles." Motor vehicles include passenger cars, trucks, truck tractors, buses, taxicabs, hearses, ambulances and other motor vehicles but does not include motorcycles, fire apparatus and tractors other than truck tractors.

The code filed by the Federated Truck Associations of America applies to all operators of motor or horse-drawn vehicles. In addition to the labor and wage provisions given in the accompanying box it covers unfair practices. Included in the latter are: Transporting at less than reasonable compensatory rates, failing to charge for proprietor's own services, giving secret rebates, bribery or discrimination in charges for similar services. The code also contains the "merit" clause which aroused much comment as a part of the N.A.C.C. code for manufacturers.

Applying to carriers for hire the code filed by the American Highway Freight Association specifies that those engaged in the industry shall register with the association and shall pay such assessments as shall be required by the association, with the approval of the President, to pay the expenses of securing and administering the code. This code bans free storage in warehouses or on trucks, rebates, false weight or special privileges. This code is intended to be a general or "shell" code to which supplements or appendices will be filed to cover territorial or functional differences. Territorial appendices were filed by the Northwest Regional Committee, the Colorado Federation and New England interests.

The independent repair shops rank high in number of establishments and volume of business as well as in number of local organizations. The National Automotive Maintenance Association, the outgrowth of the Indiana association to national scope, has asked approval of labor exceptions to the blanket code and has filed a code for the

# THE MOTOR TRUCK INDUSTRY



## The Dealer Code

### HOURS OF LABOR

Forty-eight per week except for salesmen and watchmen.  
Fifty-two per week for place of business.  
Exempt; executives and managers paid \$25.00 per week or more; emergency work.

### WAGES

Mechanics 50 cents per hour except lower rates as of July 15, 1929, may be continued, with absolute minimum of 30 cents.

Any employee:

\$15.00 per week in cities of 500,000 or more.  
\$14.50 per week in cities of 250,000 to 500,000.  
\$14.00 per week in cities of 2500 to 250,000.  
Increase 20 per cent in towns of less than 2500 up to \$12.00.

Full time commission salesmen:

\$17.50 per week in cities of 500,000 or more.  
\$15.00 per week in cities of 250,000 to 500,000.  
\$12.50 per week in cities of 2500 to 250,000.  
\$10.00 per week in towns of less than 2500.

### FAIR TRADE PRACTICES

New vehicles must be sold at list plus charges.  
Trade-in allowances shall not exceed average current sale price in marketing area minus 20 per cent.  
Parts, accessories and supplies shall be sold at list except to authorized dealers, sub-dealers or authorized service stations.

## The Blue Eagle Operator Code

Pending hearings on, and adoption of, a permanent code, employers complying with the following labor and wage exceptions are entitled to Blue Eagles.

### HOURS OF LABOR

Forty per week for clerical and office employees.  
Forty-eight per week, averaged for three months, for drivers, helpers and dispatchers, except on intercity or line haul operator may use hourly basis or mileage ratio. Mileages equal to 48 hours of labor are: 720 for tractor, semi-trailer and extra trailer train, 960 for tractor and semi-trailer or truck and trailer, 1099 for truck.

Exempt: Managers receiving more than \$35.00 per week, emergency repair work, outside salesmen or solicitors, watchmen or station managers.

### WAGES

Any employee: Forty cents per hour except lower rates as of July 15, 1929, which may be continued with absolute minimum of 30 cents in the North and 25 cents in the South.

## The Truck Associations Codes

### FEDERATED TRUCK ASSOCIATIONS OF AMERICA

#### Application

To all operators of horse-drawn or motor vehicles, except those whose trucks come under industrial code.

#### Unfair Practices

Transporting property at less than reasonably compensatory rates.  
Failing to include allowance for proprietor's services in cost.

Giving secret rebates, obtaining business by bribery, discriminating in charges for the same service to different shippers.

#### LABOR AND WAGE PROVISIONS

In general the same as the Blue Eagle Operator Code.

### AMERICAN HIGHWAY FREIGHT ASSOCIATION

#### Application

To carriage of property for hire by motor vehicles, teams and drays.

#### GENERAL PROVISION

Any natural division of the industry by territory or class of operation may agree upon rates which, when approved, become fair practices.

All those engaged in the industry shall register with local administrative agencies of the American Highway Freight Association.

Those registering are subject to assessment "as shall be required by the American Highway Freight Association with the approval of the President" to cover the expenses of "institution, filing, securing approval of, and administering this code."

Labor provisions of the code, apply to trucks of private operators who elect to follow the labor and wages provisions of the trucking code rather than their industrial codes.

#### LABOR PROVISIONS

Drivers, helpers, mechanics, billing and rate clerks and station labor 48 hours per week—208 hours per month—averaged over three months' period. Any employee working under this provision must take rest period of eight hours after 16 hours of continuous work, including meal time. Employees riding in sleeping compartments in cabs not considered on duty.

Other employees, except managers and executives, salesmen and station managers, are limited to 40 hours per week—174 hours per month, averaged over three months.

#### WAGES

Minimum \$16.00 per week, except lower rates as of July 15, 1929, which may be continued with absolute minimum of \$14.00 per week in the North and \$12.00 in the South.

Temporary employees are to be paid minimum of 30 cents per hour in the North and 25 cents in the South.

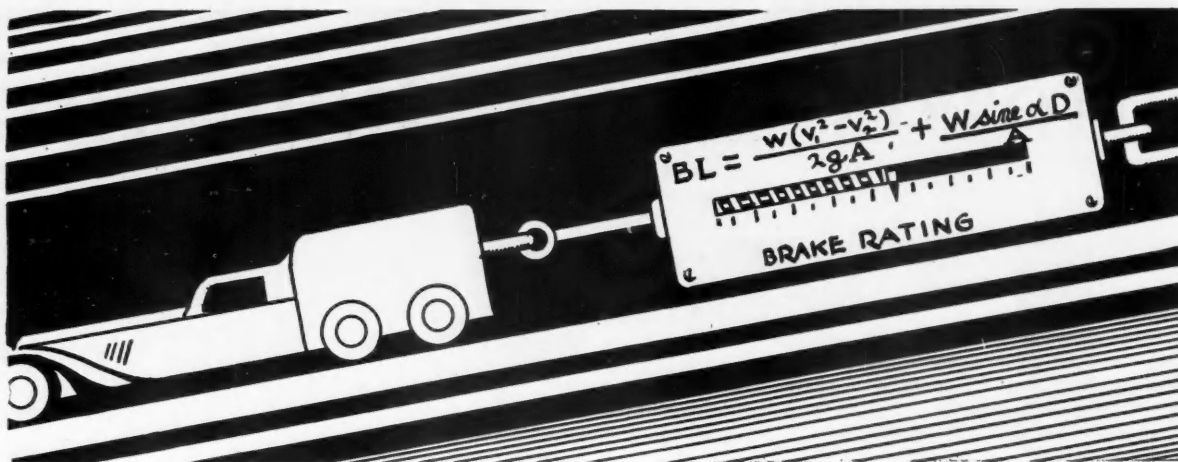
industry. For purposes of administering the code the retail maintenance industry is divided into three groups; garages and repair shops, storage garages and parking stations and, for the third group, specialists. Trade discounts by wholesalers are to be restricted to those actually in the trade as listed by local or state associations, fleet discounts are limited to fleet consumption, not to employees, merchandise must not be sold at less than list price, accounting records must be established and charges for work are to be based upon an approved flat rate manual.

Labor provisions of the code establish a 48-hour week for skilled labor, 56 for unskilled, a minimum wage of 50 cents per hour for skilled labor and for unskilled labor the country is divided into three sections with schedules in line with the President's Reemployment Agreement.

Trailer manufacturers propose to regulate the manufacture and sale of trailers in no uncertain terms. The unfair practices section of the trailer industry code prohibits the sale of trailer assemblies or parts for the building of trailers to those not actively engaged in building trailers on Aug. 1, 1933. Trailers and trailers with bodies only may be traded-in on trailer sales and the allowance is limited to 30 per cent of the purchase price of the new trailer. Minimum payment for time sales is set at 25 per cent and the period of payment shall not exceed 18 months, with equal monthly payments. Maximum discounts on trailers and parts to factory branches, distributors and trailer manufacturers shall be 30 and 10 for cash, 30 per cent on time. Maximum discount to consumers is based upon number of units in fleet including trucks. Owners of one to 9 units get 5 per cent for cash, owners of 10 to 49 units are allowed 10 per cent, 50 to 99 unit fleets rate 15 per cent, fleets of 100 or more units pay list less 20 per cent.

Hours for factory workers are limited to 48 in any one week and 40 average. Wages vary with population of factory site municipality from 40 cents per hour for 500,000 population to a minimum of 30 cents per hour.





## Brake Capacities May Be Rated to Promote Highway Safety

S.A.E. committee works on a formula using gross weight, grade, speed and lining area

**W**HEN an object suddenly appears in front of a truck the driver wants plenty of stopping ability at all costs. Torsional strains, coefficients of friction, thermal capacity and weight transfer mean just nothing at all. He wants to halt, stop, come to rest at once. The driver quite justly expects the brakes in such emergencies to confine themselves to decelerating and not undertake to steer the vehicle.

Descending a long grade is another matter. The driver expects brakes to keep the speed within bounds and to stop the vehicle. He wants the brakes to be effective at the bottom of the hill as well as at the top; fading brings no joy to his heart.

To "anchor" a truck on the level or on a hill a brake which can be locked on is needed. It must not be guilty of allowing creeping even on steep grades.

Drivers would like to be able to apply the "anchor" without any gymnastic tricks and to release it without bending down the floor boards. The owner and his maintenance staff expect brakes to provide reliable service with a minimum of attention and cost.



**B. B. BACHMAN**  
*Chief Engineer, Autocar Co.*



**DAVID BEECROFT**  
*Bendix Products Corp.*

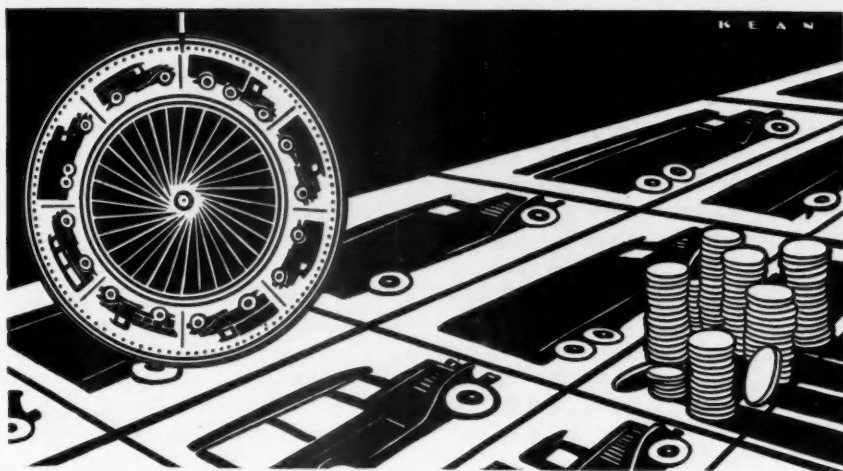
Who, then, shall say, "these are good brakes; those are dangerous?" What constitutes "adequate" brakes? How shall brake effectiveness be measured, or rated? Many wise, learned and capable gentlemen disagree in their answers to these questions.

Foremost among the discordant gentlemen are legislators of the sovereign states of the United States who, although inspired by identical zeal to protect the travelling public, arrive at singularly diverse conclusions about how to attain the desired safety. Some incorporate technical specifications, others specify "adequate" and let it go at that, still others establish a rate of deceleration and put it up to the vehicle designer to meet the requirement.

Small wonder, therefore, that motor vehicle administrators in conference assembled found it difficult to agree upon a common degree of adequacy and that they sought counsel with the N.A.C.C., as representing factory opinion and that the S.A.E. was invited to bring its talents to bear upon the question.

Whereupon and therefore, B. B. Bachman, Autocar, became chairman of a committee appointed to look into the matter and David Beecroft, Bendix Aviation Corp., studied the subject of legislative requirements for brake effectiveness. Both reported their findings to date to the S.A.E. Engineering Congress at Chicago.

(TURN TO PAGE 36, PLEASE)



## Buying the Right Truck Should Not Be a Game of Chance

**T**HE successful management of a motor vehicle fleet includes, among other things, the ability to fit the correct vehicle to a given job. A fine degree of distinction exercised in the purchase of new equipment will be reflected throughout its life in costs of operation and vehicle service value.

The physical and mechanical complexity of the simplest vehicle requires a thorough knowledge of operating requirements and the consideration of every detail that can bear on and affect a choice.

No transportation manager can be expected to possess, at all times, a knowledge of all the details of operation and work requirements as they apply to the vehicles in his fleet. It is imperative however, that they be developed when new vehicles are to be provided so as to make the best specification and choice.

(This article is excerpted from a paper presented by Mr. Orr at the S.A.E. Transportation Meeting in Chicago.)

**W**HEN we want a new truck to do certain work, or when existing trucks are ready for replacement, how do we determine the type of new vehicle to buy?

We first try to apply a truck with a standard body, such as express, platform and stake, panel, or dump. If this can not be done, the necessity for something special must be thoroughly justified. Special trucks are invariably higher than standards in first and op-



By **JOHN M. ORR**  
*General Manager, Equitable  
Auto Co., Pittsburgh, Pa.*

erating costs, and have less flexibility for reassignment or to meet changed work conditions. Obsolescence is more likely to appear during their life.

In any event, it is necessary and advantageous to develop work requirements and operating conditions, to make the best choice of body, cab, and chassis, whether it be standard or special. The greater the degree of thoroughness, the greater assurance we have against misfits in our fleet.

In providing motor vehicle transportation we have found that all details of work requirements are important to consider in the purchase of a new vehicle. Careful analysis has often suggested or shown that lighter vehicles,

Here's how a public utility fleet picks the right type of vehicle for a given job

smaller bodies, or bodies better suited to the work could be used. Trucks with standard bodies have replaced special body jobs, and vice versa. We have been careful not to allow precedent in the size or type vehicle formerly used influence the type of new vehicle furnished, but rather to start with fundamentals and rejustify the necessity of each vehicle and its various components at the time of replacement. One result of this policy is a group of ten 3½-ton overhead lines trucks that are being replaced with similar 2-2½-ton trucks, saving \$7000 per year. Another is that of a special bodied 1-ton radio interference truck that we have replaced with a half-ton standard panel. Many ¾ and 1-ton trucks have been replaced with ½-ton.

### • How It Is Done

We determine work requirements and operating conditions thus:

#### 1. Work Requirements.

- a. Number of men to be carried, which represents appreciable weight in a large crew.

- b. Tools—types, sizes and weights.
- c. Materials—types, sizes and weights.
- d. Special features or requirements—sizes and weights.
- e. Body—type, size and probable weight.

Gross weight, exclusive of cab and chassis, and proper wheelbase can be developed from this information, which enables us to designate the gross weight or tons pay load capacity chassis range from which a selection will be made.

## 2. Operating Conditions.

- a. Type of territory in which the unit will be operated, whether mountainous, hilly or flat. Unusual power requirements.
- b. Type of roads, whether good, average or poor, improved or unimproved.
- c. Average and maximum running speeds required. Mileage.
- d. Load conditions, type and degree of severity. Possibility, probability and extent of overloads that may be carried.
- e. Permanency of use of a particular vehicle and the possibility of obsolescence, which will influence the chassis price range from which a choice can be made.

I should like to repeat that standard bodies are to be preferred over special bodies. If, however, a special body is to be provided, we first try to fit an existing special body type to the job, which is an advantage in many ways. There is no development cost. The truck becomes one of a similar group, uniform in design and appearance. It lends itself more to ready reassignment if necessary and the same type vehicle is more likely to be available as a replacement when, through accident or normal use, it has to be shopped for repairs or painting.

Bodies should be built of materials that give sufficient strength at lowest weight and justifiable cost, and should conform to fleet standards as closely as possible. They should wear out with the chassis, and be substantial enough so as not to require excessive maintenance. While many bodies can be transferred to new chassis, possible obsolescence must be reckoned with, and it is somewhat of an uncertainty as to whether transfers will be desirable or possible without expensive or ill-suited alterations.

Development of vehicles is very rapid. Once built and placed in service, extensive changes should be avoided as they tend to increase the period that a vehicle must be used, with its attendant possibility of obsolescence and necessary write-off.

After the foregoing information and data have been developed, and we know rather definitely the type body that will be required, we are in a position to identify the chassis type and price range into which the application falls

and from which a choice will be made.

## • Chassis Selection

This is influenced by the severity and permanency of the application, probable mileage per month or per year, speed requirements and whether sustained high speeds are necessary, possible overloads, character of territory operated in, etc. I refer here of course to differences in the specifications of similarly rated chassis by various manufacturers.

In the final choice, the following comparisons between chassis will point out the one best suited to the application:

A. A comparison of physical and mechanical specifications.

B. Net chassis cost, preferably before deduction of trade-in allowance, although it may be necessary to include it for equalization in some cases. Accessories included in list price or that must be added as extras.

### C. Degree of Dependability:

- 1. Mechanical design. Conformity with current design and practice. Efficiency. Balance.
- 2. Sturdiness of construction.
- 3. Quality of materials and workmanship.

### D. Traction and performance ability:

- 1. Use of standard or optional gear ratios, local operating conditions governing selection.
- 2. Tire and wheel equipment. High pressures or balloons. Adequacy of tire capacity.
- 3. Road clearance. Important where operation is over unimproved roads.

### E. Operating Characteristics:

- 1. Ease of steering.
- 2. Acceleration.
- 3. Deceleration. Type and adequacy of service and parking brakes. Advisability of brake amplifiers or boosters, air or electric brakes.
- 4. Lighting and starting equipment.
- 5. Speed and grade abilities in various gears and with various gear ratios.

### F. Styling and appearance:

- 1. Whether modern and pleasing.
- 2. Cab size, appearance and construction. Comfort. Plate or safety glass in windshield and doors. Proper and convenient arrangement of controls. Vision.

### G. Accessibility for service and repairs.

H. Availability and cost of repair parts and service facilities.

I. Initial cost and probable maximum economical period of use, expressed either in miles or years, preferably the former. Probable cost of operation in this period.

### J. Body:

- 1. Design and construction.

### 2. Type and manner of mounting.

K. Performance records and experience with various makes. Reputations of makers.

All other things being equal, choice is preferably made from chassis makes and body types that, through a long period of satisfactory use in a particular fleet, have become that fleet's standards. Capacity, or gross weight groups are limited to as few as are practicable for the kinds of truck work done. Some of the advantages of chassis and gross weight group standardization are:

- 1. Fleet simplification and flexibility.
- 2. A more uniform road appearance. Greater advertising value.
- 3. Maximum ability to compare costs within the fleet and with other fleets.

For the self-maintenance operator:

- 4. Minimum investment and space required for stocks of parts and supplies peculiar to the particular makes and models in a fleet. Interchangeability of parts.
- 5. Low material pickup cost.
- 6. Simplified repair practices. Employees are required to familiarize themselves with the peculiarities of a comparatively few makes and types, and they become more expert in their work. Special tool equipment is minimized.

For the outside maintenance operator:

- 7. A greater concentration of work at fewer points.
- 8. Fewer dealers or repair agencies to contact. Greater interest by dealers or repair agencies as volume of work is increased. Better prices for work of certain kinds. Less likelihood of necessary work being delayed or vehicles out of service for lack of parts.

A completed vehicle should present a pleasing road appearance. Good public reaction and acceptance is important. Chassis, cab and body manufacturers have made rapid strides in styling trucks. The so-called "deluxe" lines of a few years ago are now standard in front end, hood, cowl, fender, cab and wheel equipment.

It is manifestly unnecessary to apply this plan in detail to every application for which a new vehicle is to be provided. After it has been done for the first vehicle or group of vehicles on a specific job, it is only necessary to be satisfied that work requirements and operating conditions are the same as for preceding similar applications, and that because of experience or time elapsed since original development, changes are or are not desirable.

Every detail need not be established anew for each new application, many of them being common to a particular fleet.

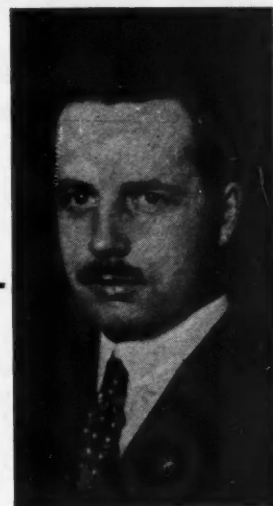
The amount of time and expense necessary in each case will be in proportion to the complexity of the application.



# How to Select Gasoline to Effect Economy

- From the standpoint of minimum fuel consumption for a given desired performance, the fuel should have a low vapor pressure and a high volatility.
- Under many conditions, a compromise is necessary between vapor pressure and 10 per cent point temperature.
- Also a compromise is necessary between volatility and gravity of the fuel.
- For a fleet operator who is willing to make suitable carburetor adjustments, careful fuel selection can result in considerable saving in fuel consumption.

(Excerpted from paper presented at S.A.E. Congress in Chicago)



By DR. O. C. BRIDGEMAN  
Chief, Liquid Fuels Section  
Bureau of Standards

**T**HE three properties of the fuel which affect fuel consumption are gravity, vapor pressure and volatility.

It is a basic fact underlying the theory of internal combustion engine operation that the higher the specific gravity of the fuel, the smaller will be the fuel consumption in gallons per mile, other considerations being identical. Over the range of gasolines ordinarily used at present, the difference in energy content amounts to about two per cent. It is rare, however, for the other factors affecting fuel consumption to remain unchanged with a change in gravity, and some of these factors may affect the fuel consumption to an extent several times greater than that caused directly by variations in gravity.

Vapor pressure affects the fuel consumption in that it determines the evaporation loss in the supply tank, and in the vacuum tank if the engine is equipped with this type of fuel system, and in the fuel lines as the result of boiling of the gasoline. Volatility affects the fuel consumption during engine starting, warming-up and accelerating, and also in engines where there is irregular distribution of the charge to the various cylinders.

From the standpoint of evaporation loss, use of a low vapor pressure fuel increases fuel economy. This is particularly true with vacuum tank systems, where above a limiting vapor pressure, fuel losses may become excessive.

## ● Boiling in Fuel Lines

During the past few years, there has been a gradual increase in the capacity of fuel systems for handling vapor without vapor lock or any appreciable falling off in performance under many operating conditions. Most of the vapor is vented off through the carburetor float bowl and represents fuel con-

sumed without any returns in the way of horsepower developed. If two fuels are considered, one having so high a vapor pressure that the car is on the verge of vapor lock and the other having a vapor pressure such that the fuel is not boiling in the feed lines, then, for an average car, there will be a difference of about 12 per cent in fuel consumption, while in the extreme case, a difference of about 20 per cent in fuel consumption may be observed.

Much can be done in the way of controlling fuel losses, and hence fuel economy, by careful selection of the gasoline as regards vapor pressure and type of distillation curve. If the vapor pressure is kept sufficiently low so that there is no boiling in the fuel lines, which is the ideal condition, then the type of distillation curve is unimportant.

## ● Engine Starting

Selection of a fuel with a low 10 per cent point minimizes the fuel consumption during starting. As an illustration, consider an engine of average displacement which starts in 10 crankshaft revolutions when supplied a 1 to 1 mixture of air and a gasoline having a 10 per cent point of 176 deg. F. For every 100 starts, two gallons of fuel will be consumed. If, now, a fuel with a 10 per cent point of 138 deg. F. was used, without carburetor adjustment, the engine would start in five crankshaft revolutions and in 100 starts, one gallon of fuel would be consumed. This difference in fuel consumption of 0.01 gallon per start as the result of increased volatility may seem rather small, but on the other hand, it might become a considerable item in the case of equipment making short hauls with frequent starts.

From the standpoint of fuel economy during engine starting, it appears desirable to have a fuel with a low 10 per

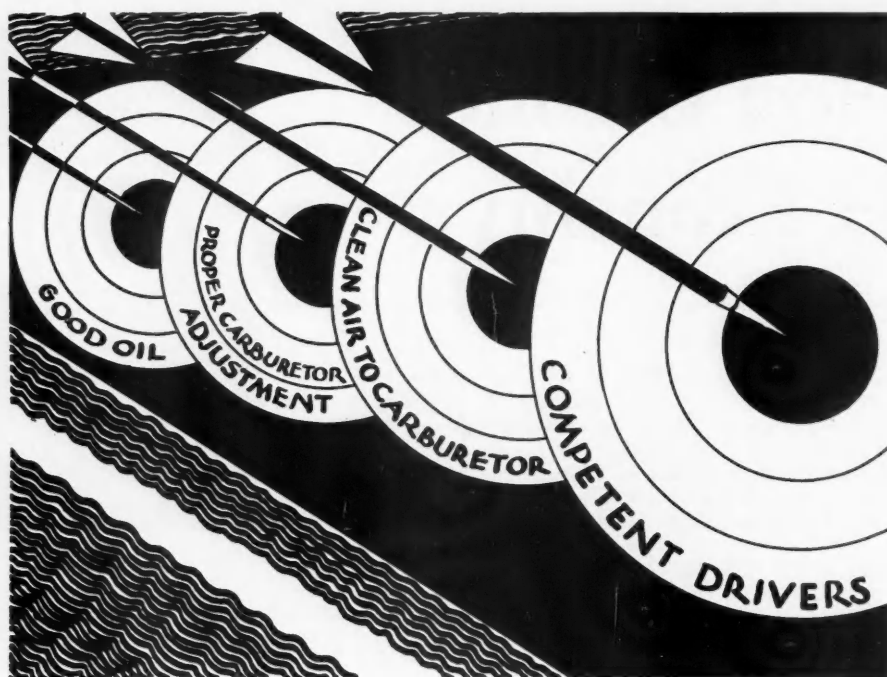
cent point. This consideration, however, conflicts to some extent with the desirability of using a fuel having a sufficiently low vapor pressure to prevent boiling in the fuel lines, and particularly during the spring and fall, a compromise may be necessary.

## ● Engine Acceleration

The desire to obtain rapid engine acceleration is one of the major causes for high fuel consumption in present-day equipment. Since carburetors are adjusted for a very rich mixture in order to obtain rapid acceleration, a sacrifice in this type of performance might result in a decrease in fuel consumption of as much as 25 per cent under some operating conditions. For any type of equipment and mixture temperature, the more volatile fuel can be used with a leather carburetor setting, and hence with less fuel consumption.

## ● Mixture Distribution

Available information indicates that distribution to the various cylinders depends to a large extent upon the degree of effective vaporization at the point in the manifold at which branching occurs, as well as upon the design of the various branches. Since the volatility of the fuel affects the percentage vaporized at the operating mixture temperature, and since it is necessary that the charge entering each cylinder be at least sufficiently rich to ignite, it is evident that volatility of the fuel plays an important part in fuel consumption. The poorer the design of manifold from the viewpoint of distribution, the greater is the effect of fuel volatility.



## Operators Must Hit 4 Marks to Prolong Engine Life

BY MALCOLM BACON, LUBRICATING ENGINEER

**T**O prolong engine life, four important things are needed. In order of their importance, they are:

1. A competent driver.
2. Clean air to the carburetor.
3. Proper carburetor adjustment and good gasoline.
4. Good oil.

I believe that a truck with a competent driver in charge—a truck which is mixing clean air with good gasoline from a properly adjusted carburetor—can operate successfully on any oil from SAE 30 to SAE 60, depending on the type of service involved, provided it is a good commercial product from a reliable company.

Drivers can make or break a fleet owner. They are as different as black and white. There are "gear jammers" who know little and care less, while there are skilled drivers handling equipment with care and skill that stamps these men as real artists in

the transportation line just as much as Babe Ruth and Bobby Jones are artists in their respective lines. A good driver will warm up the engine gradually and never speed it beyond its rating.

In analyzing the operations of a certain large fleet over a period of one year it was found that 50 per cent of the accidents were experienced by 7 per cent of the drivers. In other words, out of 200 drivers 14 men were having half the accidents. That is the safety angle. A check-up would probably show about the same proportion holding good in repairs made necessary by careless and incompetent driving.

The fleet operator who spends most of his time in the selection and instruction of his drivers does away with a large share of his worries. By instruction we mean instruction about oil, lubrication and lines other than simply driving. An incompetent driver blames all his bearing and engine trouble on

### Bacon States:

"The four things, in order of their importance are: A competent driver, clean air to the carburetor, proper carburetor adjustment and good gasoline, and good oil." And who believes that if the first three provisions are met "a truck can operate successfully on any oil from SAE 30 to 60, depending on the type of service involved, provided it is a good commercial product from a reliable company." In October Mr. Bacon will discuss, "When should oil be drained?" We can say now that Mr. Frazer across the way won't disagree with him.

the oil, while a competent driver never has any trouble with the oil.

From 60 to 75 per cent of all cylinder, piston, and ring wear takes place during the warming up period or the first 10,000 revolutions of the engine because the cylinder walls are not lubricated until the system, splash or force feed, supplies oil to them. If a piece of equipment is carefully warmed up each time it is started after the engine has become cold the largest cause of engine wear will have been eliminated. It takes a real driver to remember this and practice it day in and day out. The proper observance of this very important fact will pay big dividends to the fleet operator.

Improper carburetor adjustment is one of the contributing factors to crank case dilution, but what is of far more significance, it adds greatly to the gasoline expense. A certain amount of crankcase dilution will occur under any conditions and does not cause any particular harm. There is, however, such a thing as having the carburetor set for a too rich mixture with the result that the gasoline bill goes up and the oil is contaminated.

Only about one fiftieth of a second is available to gassify gasoline and then mix with air when the engine makes 3000 revolutions per minute. This time is too short to give perfect combustion. Drivers want an engine that will accelerate without hesitation and that is stable while idling. These results can only be accomplished with an excess of fuel in the mixture.

A long series of tests by the Bureau of Standards to determine the composition of exhaust gases of passenger cars and trucks shows an excess of fuel consumption of 25 to 30 per cent. Other tests comparing average carburetor settings with the best settings have shown that without any other changes whatsoever fuel consumption can be

(TURN TO PAGE 32, PLEASE)

### Frazer Argues:

"The day is dawning when we are going to replace our light vehicles at from 35,000 to 40,000 miles, and our heavier units at 60,000 to 70,000. Recent cost studies tend to prove the economy of this procedure.

"And that if the amount of increased wear due to old oil being replenished from time to time, but not changed, is not going to cause any appreciable additional repair or maintenance expense during the comparatively short life of these vehicles, we are wasting good money to change oil, test oil and keep records for both."



THE changing of crank case oil in motor vehicles continues to be one of the most absorbing topics of discussion in the world of automotive fleet operation. The subject is of interest not only to fleet operators, but to the producer of lubricants, the retailers of lubricants, and to the chemical engineers. The latter three groups are quite definitely lined up on one side of the fence, while the fleet operators are lined up on the other side, although their location on that side is a more or less bewildering one.

Fleet operators are bombarded by high-powered sales arguments, and by salvos of chemical analyses which appear overwhelmingly in favor of frequent oil changes. And in truth, the chemical analyses of oils do produce very definite facts which cannot be denied. But the interpretation of these facts, the correct application from the fleet operators angle, is what provides the friction in this lubrication discussion. The meat of the whole subject is the correct coordination of chemical analyses with operating expense.

The producer, the retailer, and the chemical engineer are hunters, and the fleet operators are the targets. The hunters swoop down on every hand, in droves and herds and flocks, and the more frequently they can persuade the fleet operator to change his oil, the bigger their bag of game. And, of course, that is business. But each operator of motor vehicles has his individual problems to solve with relation to ultimate operating expense, and the vendors of lubricants fail to see those problems through the same glasses as does the operator. The fleet operators' lubrication problems are bound up in his maintenance methods, his operating peculiarities and characteristics, and his method of vehicle replacement.

## Oil Changing is Just a Bugaboo With a Costly Trail

BY WILLIAM FRAZER, SAN DIEGO FLEET OPERATOR

Mr. Clifford R. Stewart, a chemical engineer, has outlined in a recent issue of *Commercial Car Journal*, a new program for determining when the oil in vehicles should be drained, and he has explained how this system is applied to fleet operations to meet the varying individual requirements. There is a great deal of logic in his arguments, but he stands on one side of the fence, and I stand over here in the dollars and cents column with fixed bayonet to see that no red-inked figures get into that column.

Mr. Stewart quotes the many instances of his tests of motor oils showing high dilution, which, of course, results in lowered viscosity of the used oil tested. He issues a grave warning as to consequences if this oil be used too long and states that oil should be tested in all vehicles at frequent intervals to determine the correct period at which oil should be drained from each vehicle in the fleet under its individual

operating conditions. For the edification of fleet operators who are trying hard to keep the purse strings taut, let's follow this program through and see where we arrive. Let us keep in mind, first and last, that everything we do, every bit of work we perform on a motor vehicle, is going to cost us some real money in the form of labor charges.

In outlining his system Mr. Stewart quotes a specific truck in which there were 21 drains in 9361 miles, spaced at periods varying from 300 miles to more than 500 miles. He does not state how he arrived at these various periods of draining, at 300, 400 or 500 miles, but it must be assumed that the crankcase was tapped at about 100 mile intervals and a dilution test run from each tapping, otherwise the various periods at which drains were made would have been only arbitrary periods, which Mr. Stewart abhors.

If he tapped and ran a dilution and



solids test at every 100 miles, this operation was then performed 93 times in the 9361 miles the truck traveled during the test period. We cannot guess exactly how much Mr. Stewart's client paid for each dilution test, but from our own experiences in testing, I would say not less than from \$2 to \$3 each. This would make, taking the lesser figure, a total of \$186 test expense, in addition to the shop labor of tapping, bottling, labeling and record keeping, to determine the period at which oil should be changed in this one truck. And in addition to this, would be the cost of adding new oil every 100 miles to replace the amount removed from the case for testing. And this isn't all, by any means. Mr. Stewart stated that an analysis was made of the oil at every drain, and there were 21 drains. We have no exact figures on what commercial laboratories charge for a complete oil analysis, but in our own laboratory which is maintained for other purposes, but where our own oil is tested, the cost of this item runs from \$7 to \$10 per test. Multiply this by 21 complete analyses and you have an imposing figure to add to the \$186 for dilution tests.

#### ● Duplicating Expense

To give Mr. Stewart the benefit of the doubt, however, let us assume that the drains were made at only arbitrarily established periods. Perhaps he started making drains at 300 miles, then spaced them out to 400 miles, and so on. This eliminates the 100-mile tapplings and dilution tests, and leaves only the 21 drains and 21 complete analyses, at a total laboratory expense of from \$147 to \$210. Now, this expense was incurred while finding only the drain period for the truck during its one particular class of work. Supposing the truck was changed to other classes of work? The whole operation would have to be repeated with the consequent duplication of expense. But even if the truck remained on the one class of work during its entire life, the expense of first finding the correct drain period would pay for a lot of emergency engine repair work, which might accrue, according to Mr. Stewart, by not finding the correct scientific change period.

Now, let's bring the program to an actual fleet. The fleet with which this writer works consists of 175 passenger cars and trucks of assorted sizes and makes. We endeavor, as far as possible, to have the same type and make of vehicle perform about the same character of work; that is, we try not to have more than one type of vehicle performing any one class of work. Therefore, it is fairly easy to set some standard of operation for the group of vehi-

cles performing each class of work.

In this fleet, we have a block of 20 pickups of a popular model, performing a certain class of work in which each vehicle averages about 1000 miles per month, with short runs and many stops and starts. We can reasonably expect a high dilution factor in these vehicles because of low operating temperatures, or, perhaps I should say, because the normal efficient operating temperatures are not sustained throughout the greater part of their operating period. We maintain all our vehicles in good trim otherwise as to spark plugs, rings, valves, etc., and we use the best grades of oil and gasoline. Following Mr. Stewart's plan, we tap the crankcases of these 20 vehicles at every 100 miles, run a dilution test, and when the dilution and solids content is too high, drain and refill, and then make a complete analysis of the drained oil. We continue this motion on each of the 20 vehicles until we can establish a good safe average of elapsed mileage under those conditions at which to drain the case on each vehicle. We ought to operate these particular light vehicles at least 500 to 800 miles before a drain, so we've made from five to eight tapplings, and five to eight tests for dilution and solids, in each vehicle, in less than a month, before our first drain. Say the 20 vehicles were all drained at 500 miles, at the end of that time we have saddled each vehicle with an expense of \$10 for dilution tests plus another \$7 for complete analysis of the first drain, in addition to the extra shop labor in tapping, bottling, labeling, record-keeping, etc. We have to continue these operations, however, to establish a safe average, which probably will add three or four more of these \$17 charges to our costs of finding the correct change period.

#### ● Is Expense Justified

After we have found that period, is our expense justified? Will this scientifically correct changing reduce our repair and maintenance expense on our vehicles to an extent sufficient to get back the money expended for establishing the change period? Can we be assured that we will have far less ring work, or less bearing work, or less valve work in the life of each of these 20 vehicles? A good many fleet operators are retiring their light vehicles at from 50,000 to 60,000 miles. During this time under average conditions we have two ring jobs. Will this scientific changing of oil let us get 50,000 to 60,000 miles with one ring job? We now have during this same mileage about five or six valve grinds. Can we get by with two or three valve grinds under Mr. Stewart's system? We have at least one rebore with ordinary

changes of oil under the "Good old Spanish custom" referred to by Mr. Stewart. Can we run our engines 60,000 miles without any rebore if we adopt Mr. Stewart's program of scientific changes? That's what we'll have to do if we're to justify spending that large amount of money to establish these change periods.

#### ● And More Expense

But we are not through yet with this gargantuan expense Mr. Stewart is fostering. It must be remembered that, in the example above, the figures quoted are for obtaining only the correct change period for each of those 20 vehicles on that one class of work. Most fleet operators are constantly changing the character of work performed by individual vehicles. We may operate our example block of 20 pickups on that type of work for six or eight months. Then, because of lack of work to keep the 20 busy in that kind of work, or because we find that a couple of these pickups are not getting enough mileage for their age, to keep them on a mileage parity with other vehicles of the same make and type and of the same age, we find we have to transfer these two vehicles to another type of work. We have to start all over again with these two vehicles, tapping and testing and draining, and record-keeping, to establish a new period of draining for these two vehicles under the new operating conditions. Higher and higher, then, grows this pile of expense. In a fleet the size of ours, we are constantly changing assignments of vehicles in this manner, so it doesn't take a pair of binoculars to see that this duplication of expense in determining the scientific change period for each vehicle under each different character of work, soon becomes a veritable dragon which gobbles up our profits in short order.

Large fleets are operated to a great extent upon averages. We can only pay a certain amount of attention to individual vehicles. Beyond that certain amount individualism is an exceedingly expensive proposition. Now and then an individual vehicle will develop a fault, but we cannot spend huge sums on all of the vehicles in our fleet to prevent an occurrence to one or two of the vehicles. Supposing, as Mr. Stewart states, a sand hole in the block of one motor develops a leak and we get an engine full of soap. We can buy a new block, pistons, pins, rods, etc., far more reasonably than we can pay expensive preventive attention to all of the vehicles in this fleet by following Mr. Stewart's plan.

Such items as a poorly applied head  
(TURN TO PAGE 32, PLEASE)



*The Autocar engine-under-seat design is used to illustrate the gain in weight carrying ability or load space possible by rearranging chassis layout. The truck at top can carry greater gross weight with axle limit than the middle truck. The lower truck provides more load space within overall length of middle truck*

**T**HE constant whittling by state legislatures of size and weight of trucks permitted to operate upon the highways has turned the thoughts of factory engineers toward designs which make it possible to carry larger loads within the prescribed limits. Whether or not these vehicles are more efficient mediums of transportation than conventional designs is beside the point. The vital question is how to attain best efficiency under conditions imposed by the law-making bodies.

Restricting size and weight quite obviously reduces the load which can be carried but the effect of the two restrictions differs. Light, bulky loads, empty cardboard boxes for illustrations, take up a lot of room and ample load space is required to make up a heavy load. When length and width and height are restricted the space in which the load can be carried is cut down. This involves the problem of getting more effective load space within certain dimensions.

If all truck loads were pig lead the size restrictions would not be so important—the limiting factor would be weight. If a state limits vehicle gross weight that is the end of the matter and all a designing engineer can do is to reduce chassis and body weight thus making it possible to carry more

payload. Much has been accomplished along this line and more will be.

It is the axle weight limit imposed by numerous states which gives the factory engineer a chance to make a showing. If the axle weight limit is fixed at 16,000 lb. as in Nebraska, North Dakota, Virginia and others and there is no restriction on vehicle gross weight, the theoretical maximum gross weight for a four-wheel truck is 32,000 lb. Nothing approaching this maximum is attained because the load commonly carried on the front wheels of a four-wheeler is much less than that on the rear wheels. A compilation made in 1919 shows rear wheels carrying 80 to 90 per cent of total weight in many instances. Seventy-five to eighty per cent are common today.

Increasing the load on front wheels is a logical way of increasing vehicle gross weight and of payload in states which limit axle weights. With single front and dual rear tires of the same size, as used on a larger percentage of truck models listed in Commercial Car Journal Specifications Table, distributing one-third of the gross weight on the front wheels and two-thirds on the rear wheels gives equal tire loading. Under these conditions a vehicle gross weight of 24,000 lb.

# Legal Limits Put Larger Loads Up to Designers

Factory engineers seek ways of putting greater percentage of the gross vehicle weight upon the front axle

By JAMES W. COTTRELL

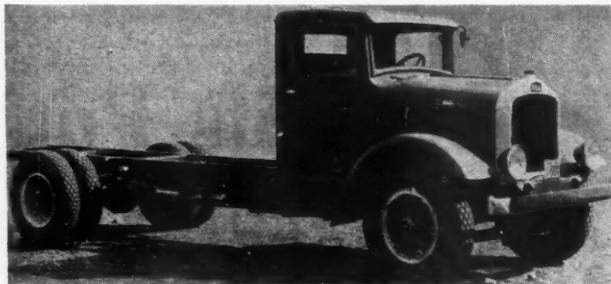
TECHNICAL EDITOR, COMMERCIAL CAR JOURNAL

is attained with an axle weight limit of 16,000 lb. which is 4000 lb. more than the gross if front axle load is only 25 per cent and rear 75 per cent.

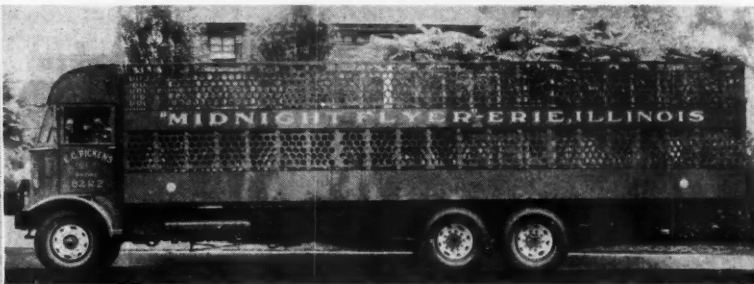
Restricting length of single vehicles, or of combinations, and allowing high vehicle gross weights puts a premium on body floor area. This space can be increased within an overall limit by placing the cab further forward or right over the engine and, in case of tractors and semi-trailers or trains, by close coupling. Some very interesting designs have been evolved to meet the 40 ft. combination limit as in Illinois, two typical examples of which were shown in the trailer story in the April, 1933, issue of COMMERCIAL CAR JOURNAL.

A Committee of the American Petroleum Institute has been studying the question and a preliminary report made by J. F. Winchester, Standard Oil Co., of N. J., and a vice-president of the S.A.E. representing transportation activity shows the possibilities of increasing payload by putting more weight on front axles. One section of the report shows that in states which limit axle loads to 16,000 lb. and permit gross weight of 24,000 lb. or more on four-wheelers, as in Illinois, Missouri and several other states, the payload can be increased about 20 per cent by greater loading of front axles. With gross weight distributed about 25 per cent on front axle and 75 per cent on rear axle the body and payload weight is distributed 8.8 per cent





The new White K series, modifications of six models carry a larger percentage of weight on front axles



Load space was increased by reducing bumper to back of cab distance to less than 6 ft. in overall length of 35 ft.

on front axle and 91.2 per cent on rear axle. The payload including tank body is 12,270 lb. or approximately 1255 gal.

Switching 20 per cent of payload to front axles puts one-third of the gross load on the front axle and two-thirds on the rear axle. With this arrangement the payload mounts to 15,200 lb., equal to approximately 1515 gal., a gain of 260 gal., or 20.7 per cent. In New York which allows 22,400 lb. on an axle and 36,000 lb. gross for a four-wheeler the permissible load can be increased by distributing the weight one-third in front and two-thirds in the rear from 2030 gal. to 2500 gal., a gain of 23 per cent.

Engine-under-the-seat construction, of which Autocar is a typical example, can be used to distribute more weight on front axle or to increase the floor area, as shown in the accompanying drawing. Of course, it can be employed to reduce the wheelbase for a given body length. The three applications are shown and explained in the drawing on page 21.

The White Co. has modified six models to carry more of the weight and of payload and body on the front axle than with standard models of the same wheelbase and carry the total gross load legally permitted. Four of the six models have the back of the cab moved closer to the front axle by bringing the engine through the dash and in two of them in addition the front axle is moved to the rear. One of the new series carries

2000 lb. more gross weight than its conventional counterpart. These models are described in the new truck pages of this issue.

Without attempting to review all examples of modification of standard designs to take better advantage of state regulations a few others may be mentioned. The Hug roadbuilding truck with overhanging power plant is in this class. Hendrickson built a six-wheel truck and four-wheel full trailer within 40 ft. overall, placing the cab so far forward that the distance from front bumper to back of cab is only 62 in., and Corbitt produced a flush front six-wheeler carrying loading space 27 ft. long within an overall length, including bumpers, of 30 ft., an increase of approximately 4 ft. in load space compared with a conventional truck. An early example of forward cab position is shown in the Ear-to-the Ground Department in this issue.

Let no one assume that the end has been reached. Fleet operators and factory officials are studying the problem and taking steps to meet it. Asking factory men for their opinions, for publication or in confidence, revealed keen interest in the subject—and much activity. A. G. Frazer, Kleiber, calls for action observing that "the load distribution per axle of European trucks is more or less what it should be and I believe that eventually this will be carried out in this country." A. G. Herreshoff, Dodge Bros., notes a definite trend toward putting greater percentage of load on the front axle.

which is "along the lines of truck designs of twenty years ago."

Engines located in position which does not take up any additional length are predicted by P. J. T. Rawlins, Corbitt. The White metropolitan type coach with flat twelve engine under the floor and the A.C.F. coach with a six-cylinder reclining engine amidships are in this class.

Although several engineers do not care to carry front axle loads to more than 8,000 or 9,000 lb. this weight may be exceeded in some instances. These loads raise the question of steering and more than one engineer predicts more power steering.

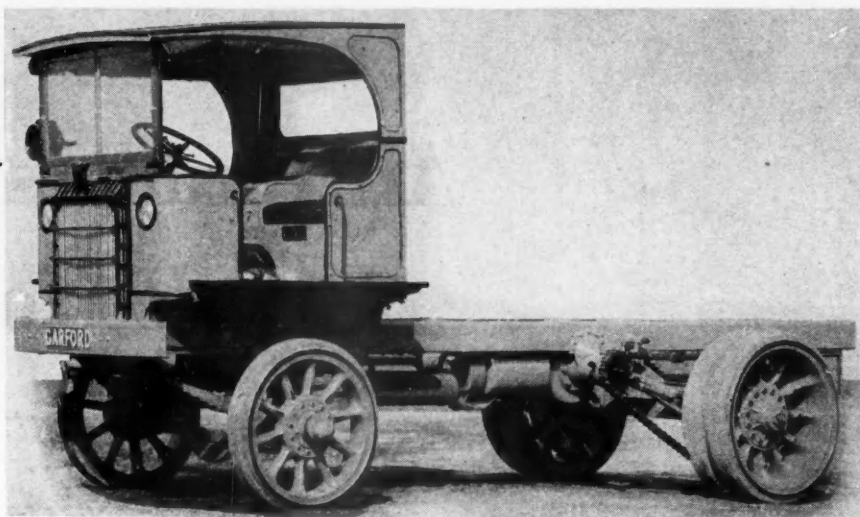
Looking into the future is not too easy, the only safe prediction is activity. M. C. Horine, Mack, sums up the situation so: "a great deal more thinking is being done than talking. We are sawing wood and saying nothing."

That thinking is being done there is no doubt. That more than one factory is sawing wood is equally certain. The very thing which inspires this activity is, paradoxically, holding it back. This is legislation. Assured that present laws would not be changed engineers would feel safe in going ahead. But they are not assured. William J. Gramm points out the difficulties of meeting regulations which are not uniform throughout all the states. He says "a customer from Kentucky wants one type of vehicle while a customer in Ohio wants an altogether different type."

Greater loads are carried within restrictions on overall length by putting cab over engine of tractor and close coupling semi and full trailers







Don't be alarmed, this isn't a new model truck. It's a Garford of 1911 vintage. We put it here simply as a reminder that the truck industry will not be without the aid of past experience in designing trucks to meet the new axle load restrictions

## THE EAR-TO-THE GROUND DEPARTMENT

### A Winton Diesel Truck?

We had to go all the way out to Chicago to learn from a White man that the Winton Engine Corp. is planning to announce a Winton truck with a Winton Diesel engine. Who would sell it? Well, isn't Winton a subsidiary colleague of General Motors Truck?

### In Fact, We'll Cheer

And it remained for a General Motors Truck man to tell us that the White company is planning a move in regard to its assembled truck line which will not surprise us. It will, however, please us. This will probably be the subject of the September announcement predicted here in July.

### "The Right Idea"

Hercules Motor Corp., we are told, is working on an entire line of Diesel engines running all the way down to the light-duty truck capacities. One truck manufacturer spoke of this as "the right idea." There's no reason why the use of Diesels should be restricted to the heavy-duty trucks. Operators of light jobs are equally interested in more economical truck operation. Details of Hercules' first Diesel are given on page 37.

### Camel-Backs Are Coming

General Motors Truck is going to come out with an engine-under-the-seat job. They see it as the only possible answer to the over-all length and axle-load restrictions imposed on truck equipment.

### Mack Joins Caravan

Mack is another company that will very soon announce what is described as "a short-wheelbase job." We surmise it will be the so-called camel-back type, that is, the engine under the seat. A Mack competitor, however, was not at all sure of this. He had heard that the engine might be slung under the floor at the side. Our surmise is based on the fact that Mack's experimental jobs have been camel-backs.

### Reverse Nomenclature

Another large manufacturer has questioned its sales organization about camel-backs. Instead of asking whether the sales organization wanted an "engine-under-the-seat" model the question was worded in reverse—"Do you want a 'cab-over-the-engine' model?" Offhand we'd say that the response to this question should be an overwhelming "yes."

### Don't Ask Questions

What official connected with the office of the Federal Railroad Coordinator moved his household goods to Washington by motor truck and his family by passenger car?

### A Monovalve Diesel

The American Diesel Engine Co., of Oakland, Calif., has developed a monovalve type of Diesel. It is a four-cylinder job that develops 125 hp. at 2000 r.p.m. By means of the monovalve arrangement and a special manifold pure air is taken into the cylinder and the exhaust discharged through the same valve and valve port in each cylinder. A detailed description will be published in this journal next month.

### Help! Help!

By the way, can anyone tell us where and by whom the term "camel-back" was originated?

### Ford 4 Going Out?

Ninety per cent of the Ford trucks sold,

we hear, are V-8's. This would seem to indicate that dropping of the 4-cylinder engine is just around the corner.

### Cast-Iron Crankshafts

Cast-iron crankshafts are being used experimentally in heavy-duty service and are showing up remarkably. Used with newly developed lead-bronze bearings the results, we are told, are something to write home about. We're mentioning this here just to undermine any prejudices you may have.

### Just Signal Us

Eight states with heavy truck registrations have enacted laws requiring motor trucks and combinations operating on public highways to be equipped with portable flares which are to be used in the event the truck is stalled or parked on the highway during the period between sunset and sunrise. They are Illinois, Iowa, Kansas, Minnesota, Missouri, Ohio, Pennsylvania and Wisconsin. We have had a number of inquiries regarding who manufactures flares. If you wish to be connected with sources of supply, write us.

### Concentrated Alcohol

A concentrated alcohol for anti-freeze use has been developed by the Industrial Alcohol group. It proofs 200, which means that a quantity of new alcohol equal to the old will go twice as far. This doubtless means the new alcohol will be put up in smaller containers.

### A Smaller Oil Filter

The Briggs Clarifier Co. is expected to announce within 30 days the production of an oil filter designed for use on light-duty equipment, or wherever frequency of changing the refill is not objectionable when used with heavy-duty equipment.

### Free, Gratis, For Nothing

The Four Wheel Drive Auto Co., Clintonville, Wis., has completed a compilation of road laws. A copy of the compilation will be sent free to any trucker. —G. T. H.

### With Our Compliments

• Reprints of the tabulation of State Motor Vehicle Size and Weight Restrictions published in the July Commercial Car Journal are available at no cost to readers.

No man in the truck industry should be without a copy of this most up-to-date interpretation of size and weight restrictions.

Address your request to The Editor.

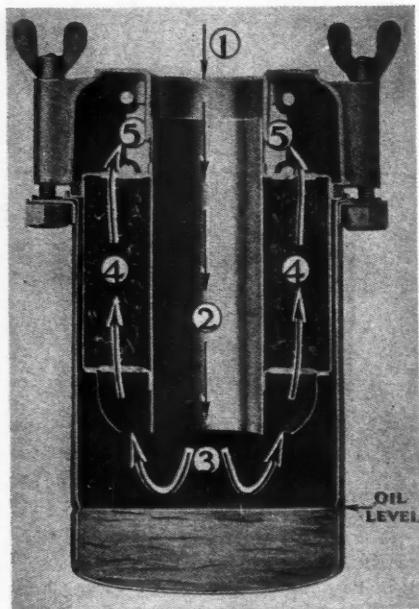


Fig. 1. Air passes downward through a central stack then upward through a copper mesh filter 4 in the AC Triplex

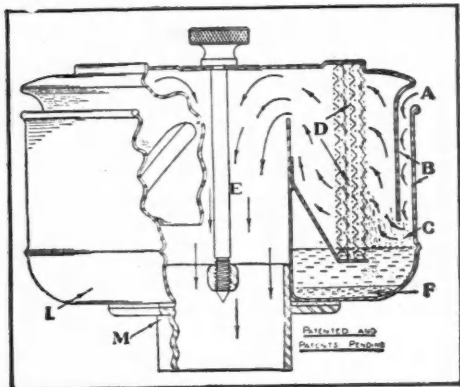


Fig. 2. The Air Maze takes in air all around, passes it through a twelve layer filter and then out at center

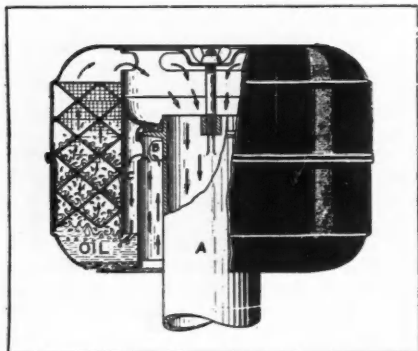


Fig. 3. Air flow is reversed three times in the Donaldson cleaner and passes through oil and oil wetted screens

**A**LTHOUGH many different types of air cleaners are used on motor vehicles and there seems to be no similarity among them, they all are based upon the fundamental difference between particles of dust and air. The difference in weight, or rather specific gravity, makes it possible to take advantage of centrifugal action by taking the incoming air around a

## Air Cleaners of the Favored for Very

### Air Cleaner Makers

- AC Spark Plug Co., Flint, Mich.
- Air-Maze Corp., 313 Caxton Bldg., Cleveland, Ohio.
- Donaldson Co., 666 Pelham St., St. Paul, Minn.
- Handy Cleaner Corp., 3925 W. Fort St., Detroit, Mich.
- Industrial Wire Cloth Products Corp., 4th & Brush Sts., Wayne, Mich.
- Michiana Products Corp., Sheet Steel Div., Michigan City, Ind.
- Orem Motor Protector Co., 2827 Calvert St., Baltimore, Md.
- Specialty Mfg. Corp., 914 W. First Ave., Spokane, Wash.
- Tractor Appliance Co., 215 Monroe St., New Holstein, Wis.
- United Air Cleaner Co., 9705 Cottage Grove Ave., Chicago, Ill.
- Vortex Mfg. Co., 121 So. Alexander Ave., Claremont, Cal.

corner or a complete circle. The difference in size is used to advantage in filters which have fine openings through which air can pass but dust particles cannot. A variation of the filter idea is based upon the dust particles sticking to an oil-wetted surface.

There is, of course, no reason why more than one manner of separation of dust particles from air cannot be incorporated in the same filter and many filters do incorporate more than one principle.

The oil bath type of filter, favored for exceptionally dusty operations, as mentioned in the article in the Aug. issue embodies more than one type of separation, the various methods usually working in series.

Centrifugal action is set up in most instances in the intake by causing the air to pass around an angle as it enters the cleaner. The air is then carried down to an oil reservoir where it is forced to reverse direction near the surface of the oil or to actually pass down through the oil and then move upward. The rapid flow of air carries drops of the oil into a filter which is constantly moistened by this action. The oil trickles down from the filter and is renewed by oil drops in the air stream. The reverse flow of air or bubbling of air to the oil traps much of the dust in the oil reservoir and this dirt works to the bottom of the reservoir as sediment.

Construction and operation of seven oil type bath cleaners is shown in the accompanying illustrations. Although they are all of the same basic type, they differ in their application of methods of separating dust particles from air.

The AC Triplex, Fig. 1, embodies three means to purify the air. The intake or stack is placed high up under the hood away from the zone of maximum dust. The entering air passes downward through a central tube and is reversed in direction directly above

an oil supply. Most of the dust is collected in the oil. The air then passes upward through a filter of oil-wetted copper mesh. When all the oil in the chamber has been used, dust which accumulates on the copper mesh causes an increase in resistance, similar to partial choking of the carburetor. This warns the operator to service the cleaner.

This unit is cleaned by taking off the oil chamber and mesh cylinder and sloshing in kerosene or gasoline. The oil chamber is filled with crankcase oil and the copper mesh cylinder is re-oiled.

The Air-Maze filter, Fig. 2, takes in air from all sides through the angular passage A. Much of the dust is deposited on the oiled surfaces of the inner and outer spaces at B. More dust is washed out when the air is reversed in direction above the oil at C. The air is then passed through a twelve layer filter D which is kept clean and recoiled by splash of oil from supply at the bottom of the cleaner. Dust accumulates in the sump at F.

This unit is serviced by removing the lower case L, dumping out the old oil

# Oil-Bath Type Are Dusty Conditions

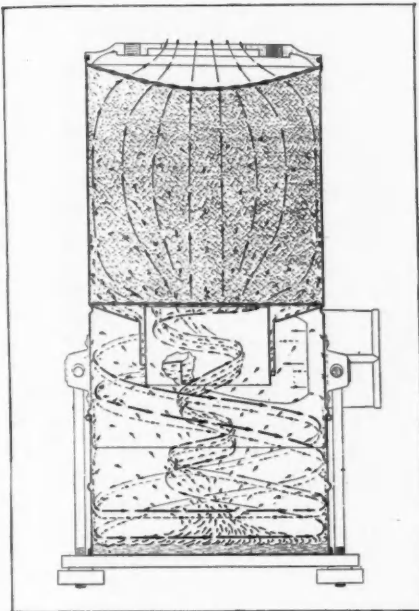


Fig. 7. The Vortex takes in air at a tangent causing a swirling action in the air above the oil chamber

and dirt and refilling with engine oil. The filter element is cleaned by moving it around in waste crankcase oil, not gasoline.

The Donaldson cleaner, Fig. 3, takes in air vertically through a pipe surrounding the clean air passage to the carburetor. At the top of this passage way, B, direction is reversed and the air moves downward until it enters the oil reservoir at the bottom. The air after passing through the oil continues upward through oil-wetted screens and at the top it again reverses direction passing downward through pipe A to the carburetor.

The manufacturers use solid castings for installing the cleaner on engines where cleaner cannot be directly connected to the air intake of the carburetor.

Air enters the CRC cleaner, Fig. 4, through the large opening A and slots AA. It strikes the baffle B and is de-

flected backward and downward and then passes through the narrow throat C. The air then deflected over the surface of the oil by the deflector D which can be adjusted to close the throat for more vigorous oil action under extremely dusty conditions. A partial partition G increases turbulence of the oil and prevents it from surging into one end. The air then passes through a series of oil-wetted screens J to K, in the center of which is the metallic sponge L. Air then passes to the carburetor through outlet M.

The cleaner element can be removed as a unit from the bottom and is cleaned in gasoline or kerosene and re-oiled with light oil.

The Handy "Perfection" air cleaner takes in air through a channel which is submerged in the oil reservoir, as shown in Fig. 5. The air agitates the oil and passes upward toward the upper element, called the condenser. Oil in the air channel is replenished from the oil chamber through a slot in the bottom of the air channel. Oil particles are carried upward into the condenser in the air after passing through an S bend. The condenser traps the dirt laden oil and returns it to the oil chamber where the dirt precipitates to the bottom.

The condenser does not require cleaning and dirt is removed by dumping the oil chamber. If the oil overflows during operation, it indicates need of dumping.

The United cleaner, Fig. 6, takes in air all around through an annular passage between an inner and outer case. The air passes downward through this passage and passes through the surface oil in the lower oil chamber. Direction is reversed at this point and the oil passes around baffles, which prevent an excessive amount of oil being drawn upward, into a filter element which is washed by the oil carried in the air stream. Air passes upward through the

(TURN TO PAGE 40, PLEASE)

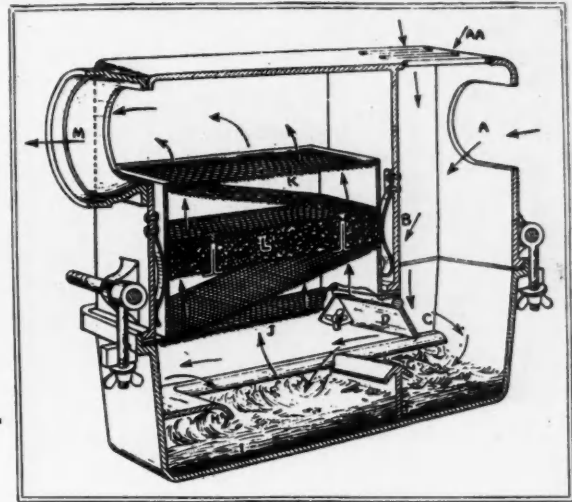


Fig. 4. Filter element of the CRC cleaner is removable as a unit. Partition D regulates oil turbulence

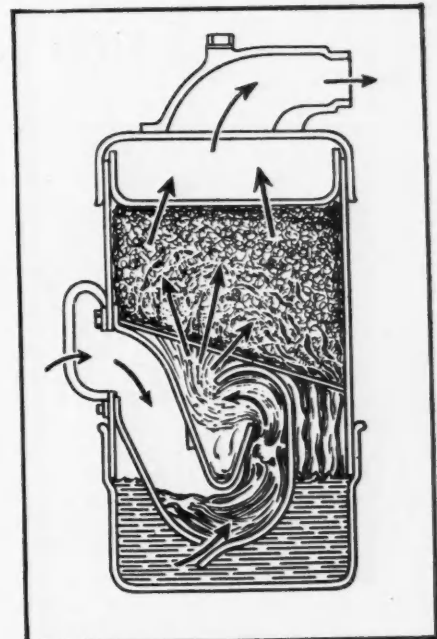


Fig. 5. Intake of the Handy is through a passage submerged in oil. The condenser does not require cleaning

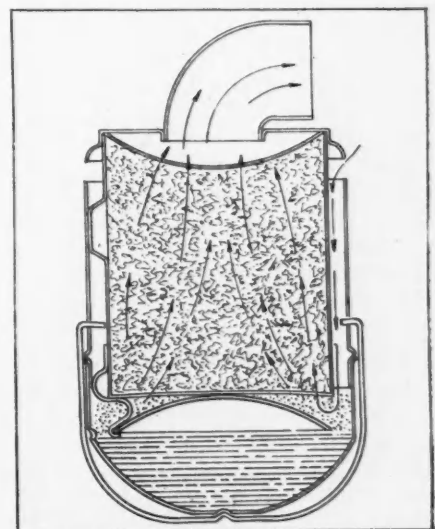
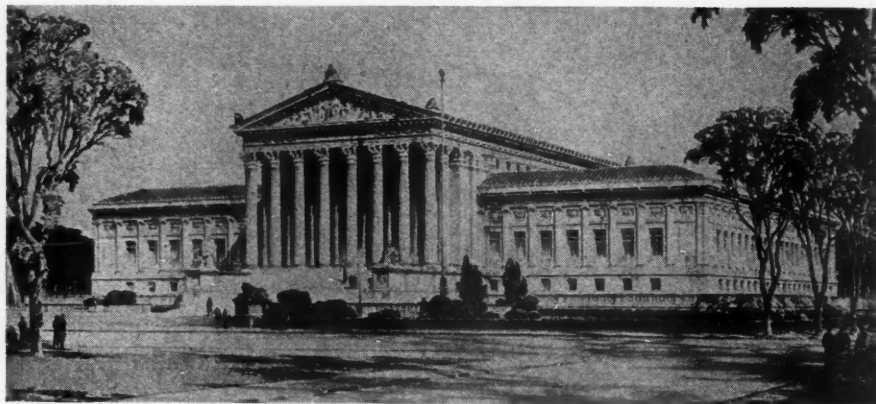


Fig. 6. A baffle at the bottom of the United cleaner prevents excess of oil being drawn into the air stream





Architect's drawing of U. S. Supreme Court Building, Washington, D. C.

## Court Decisions in Truck Cases

### Tax Action Void

*Betts et al. v. Lightning Delivery Co., et al.*  
Supreme Court of Arizona

UPON failure to file tax return, the Superintendent of Motor Vehicles was empowered by statute to file the statement of tax receipts due from a motor carrier, which he was authorized to do after informing himself "as best he may." This provision gave the Superintendent discretionary power to fix the license tax. He was not bound by the 2 1-2 per cent rate of gross receipts nor by the amount of the gross receipts nor by any rule other than his will. The power and duty of fixing the amount of the license tax is therefore legislative. This authority cannot be delegated and this section of the gross receipts tax law purporting to delegate the tax fixing power to the Superintendent was therefore void.

### Parking Defined

*American Co. of Arkansas v. Baker,*  
Supreme Court of Arkansas

MOMENTARILY parking to allow another employee to board truck, although obstructing highway, held not within statute making it unlawful to "park or leave standing" any vehicle obstructing highway.

### A Peculiar Case

*Meyers, etc. v. Railroad Commission of Calif.,* Supreme Court

A CALIFORNIA truck operator operating wholly within the state, engaged exclusively in transportation from harbor docks to nearby points, of goods being shipped in interstate or foreign commerce, is engaged in interstate commerce and the Railroad Commission may not require him

to secure a certificate of convenience and necessity, his transportation of goods constituting a link in the travel of goods in interstate commerce. While the state can establish police regulations with which he must comply, its police power does not extend to the withholding of a certificate of convenience and necessity.

### Certificate—or Else!

*Ex parte Marriott, California*  
Supreme Court

VALIDITY of the criminal prosecution provisions of the motor carrier regulatory law was upheld in denying a writ of habeas corpus to a person who was arrested for operating as a carrier without first securing a certificate of convenience and necessity.

*Ex parte Marriott, Cal. Sup. Ct., 22 P (2d) 692.*

### Status of Commission Order

*Coast Truck Line v. Asbury Truck Co.,*  
California Supreme Court

ORDERS and decisions of the Railroad Commission are final in all collateral actions and proceedings, the court held in sustaining the Superior Court's jurisdiction in an action to enjoin defendant in transporting vegetables for compensation over the highways without a certificate of public convenience and necessity.

### No Lien for Tire Dealer

*Rouse v. Paramount Transit Co., Supreme*  
Court of Kansas

A DEALER who sells automobile tires, A tubes and rims, and who installs them gratis is not entitled to a lien on the vehicle for the price of the articles since they

### FREE TO READERS

*Commercial Car Journal* will be glad to procure expert legal advice for any reader who is faced with a legal problem involving a motor truck. There is no charge for this service. Inquiries made in confidence will be so honored. Just address your letters to The Editor.

are not "material" incidentally used in performance of labor.

### Interstate Act Complete

*Sweet v. Miller, Sup. Court,*  
Erie County, N. Y.

A HUCKSTER who came to New York by motor vehicle with money to purchase a load of apples and who, after purchasing the apples, was on his return trip to Ohio, was engaged in interstate commerce although he had not yet left New York state when an accident occurred.

### Gross Receipts Tax Okay

*Pennsylvania v. Lukens, Pennsylvania*  
Supreme Court

THE gross receipts tax on the intrastate business of operators of trucks was sustained against an attack that it violated the provision of the state constitution that all taxes shall be uniform upon the same class of subjects because it was not applied to operators of motor buses and taxicabs. The court held the classification was not arbitrary, holding that the transportation of freight and baggage was merely incidental to the transportation of passengers in the case of buses and taxicabs.

### Contract Carriers Out

*Wald Storage & Transfer Co. and D. A. Beard v. Railroad Commission, Three*  
Judge Federal Court, Texas

THE Railroad Commission is empowered to exclude contract carrier motor trucks from state highways where evidence shows that bridges and roads will not bear the burden and where congestion makes their operation unsafe for the primary purpose of the highway. Three Judge Federal Court Decision states.

### Joinder in Suit Permitted

*Commercial Standard Insurance Co. et al. v. Caster, Texas Court of Civil Appeals.*

PERSON suing truck owner operating as a motor carrier for injuries sustained as a result of negligent operation may join the motor carrier's insurance company under the statute requiring liability insurance.



Goodrich has designed a slide rule to figure dual spacing of rear tires

**S**HOP men who think there is nothing new because "tools are tools" are missing a good bet. New ideas are as plentiful as "Please Remits" on the first of the month and some of the time-saving gadgets don't go in tool drawers, they serve other ways.

#### Paper and Pencil Saver

● Whether the dual spacing on rear tires of trucks is big enough to allow oversized tires or if the tires on the job have enough elbow room is shown at a glance by a new tire slide rule, by Goodrich. A black arrow on the scale is set at the center of one tire and the rule is pulled out until a red arrow is at the center of the other tire. The scale shows what oversizes, if any, can be put on without changing wheels or spacers. The other side of the rule shows high pressure changeovers in the same way.

#### Wheel Nut Spinner

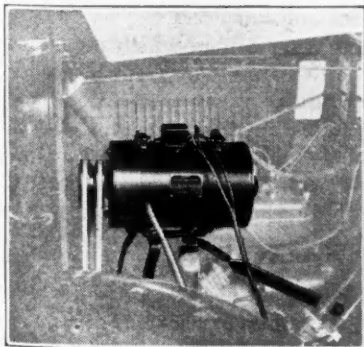
● Four arms on the Gunit wheel and rim wrench get the best of six sizes of nuts—the makers slipped two square opening inside two hexes. The wrench answers to catalog number R-1002, weighs 9½ lb. and is 4 in. longer than usual for—you know—leverage.

#### Asbestos Cable Cover

● A new heavy-duty spark plug wire made by Belden Mfg. Co. has a rubber insulating core, two coverings of black high tension lacquer all covered by an asbestos braid. Meaning its designed to stand heat—truck engines aren't refrigerators.

#### Cooling Generator

● Training a generator to give constant voltage at varying speeds is no easy trick, but Whitaker-Upp Co. tackles it. Upp generators are made in three sizes: 750, 1000 and 1500 watts; driven by V-belt from the engine crankshaft, and supply



115-v. current for refrigerating equipment for truck bodies.

## \$ALVAGE—from a Shop Man's Mail

*Being the impressions and reactions of an experienced shop man to new products offered by manufacturers. The editor will gladly put readers in touch with the makers mentioned.*

#### A Pair of Jacks

● Blackhawk plays two jacks, a short wheelbase floor jack and a Lo-Hi for vehicles. The former lifts up to 3000 lb. from 4¼ to 20¼ in. height range with double pumps. The jack lifts fast until it picks up the loads, then lifts slower.

The Model 5.5 Lo-Hi squats down to 5½ in. to get under axles and raises up to 2000 lb. 7 in. It's hydraulic, too.

#### Overflowing Is Over

● Overflow pipes are put in radiators to let steam out when the job boils but water and anti-freeze sneak out the same way. Result is a lot of bucket toting in summer and bills for frost medicine in winter. Illsley Co. proposes to stop both by placing a diaphragm type blow-off valve in the overflow pipe. It is not much bigger than a pancake for a hungry man, 3 in. in diameter for passenger car size and 4½ in. for trucks. It stops anything, liquid or gas, from getting out the overflow pipe until pressure goes above a set point when it relieves the excess pressure like a steam boiler safety valve and then shuts again. All of which saves water, restrains escaping anti-freeze, makes it possible to run cooling liquid temperatures higher without steaming and also to use closed radiation, perhaps with high-temperature cooling liquids. Prices are not high.

#### Pump Trouble Shooters

● AC Spark Plug Co. is putting out kits of two different sizes, containing diaphragms, valves, springs and a cork gasket for fixing either large or small AC fuel pumps.

#### Dent Filler

● Mechanics who have "chased" a dent around a body panel without being able to lose it are offered a new weapon. The Ace metal spray melts stick solder and blows it in body dents in spray form. The gun operates from an air line or from an oxygen tank and acetylene and applies up to 2 lb. per minute.

#### Belts on Fords

● Jacking up one wheel of a Ford and

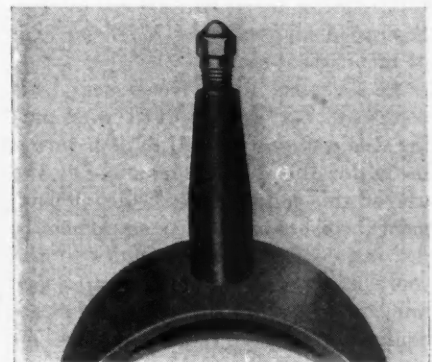
putting a belt on the rim for power for sawing wood, and such, is common, but the Heus Mfg. Co. votes no. It makes an assembly to attach to the front of A and B Fords which has a pair of bevel gears in a case driving a pulley set crossways. Pulley is 6 by 6 in., runs at engine speed; bearings are Timkens. It makes a lighter unit with extension straight shaft with pulley lengthwise of the truck.

#### About Bodies

● The Aluminum Co. of America has issued a 50 page book telling how to design and build bodies of aluminum alloy. Notes, detailed drawings and directions for fabricating, joining and painting are given for dump, van, freight, insulated and refrigerator bodies. The book also includes a list of the alloys and their application and sizes and special shapes available. Weight saving of typical aluminum bodies is given, based upon figures from operators. Copies of the book are offered to interested executives. Address Aluminum Co. of America, 1839 Gulf Bldg., Pittsburgh, Pa.

#### E-t-t-G Scores Again

● Firestone is presenting the leakproof tube, predicted in the July Ear to the Ground column. It's called Sealte-Leak-proof, costs no more than a conventional heavy-duty tube, has a tapered rubber valve stem (instead of metal) and is



coated on the inside with a special sealing compound.



By JAMES C. BENNETT  
Manager, Automotive Dept.  
Associated Oil Co.,  
San Francisco

I HAVE made a comparison of the results obtained by Mr. Collins' proposed method with those which have been realized in our own operation. Mr. Collins' theory is a most interesting one, but our experience would indicate that there must be some missing factors in connection with its development.

I say this for the reason that we selected for analysis a group of 22 cars, all of one make, all purchased comparatively nearly together, and all of which have been retired from service. In other words, we have the complete history of this group.

I may say that we selected cars merely because we do have the complete history. We have no trucks, unless it be the very light ones, whose life has been run out and which have been purchased since the inauguration of our present method of operation and accounting.

According to Mr. Collins' theory, all of the units of this group of cars should have been retired when they had traveled 62,500 miles. These cars were set up at the time of their purchase to be driven 80,000 miles. They were actually driven an average of 95,060 miles within a period of 43½ months.

At the time of retirement of what may be called the "composite car," as representing the entire group, we realized a salvage value of 17.07 per cent of the original cost.

At the time of its retirement, this composite car was credited with having made a profit of \$1,822.88 during its entire life. In explanation of the use of this term "profit," this department furnishes automotive equipment to the various operating activities of the company at varying rental rates per mile, according to the size or class of equipment. The rental rates are intended to come as nearly as possible to representing actual cost. It is evident from the foregoing figure that the rental

## WHAT'S THE ECONOMIC

rate as applied to the group had been too high, but throughout the life of the car the average rental rate had been 4.75 cents per mile.

I am inclined to think that what I may term the "stumbling block" in the way of the adoption of Mr. Collins' suggestion is the prevailing absence of any factor representing earning capacity of automotive equipment.

Any attempt to discuss this question in any sense exhaustively leads promptly to the problem presented by the common lack of a uniform method of accounting.

Mr. Collins' suggestion is most interesting and it is very possible that time will develop that it has real merit.

### By A FLEET MANAGER

*Of a large national fleet who asks that his name be withheld but with whom the editor will gladly put you in touch if you want to write him*

I HAVE read with considerable interest the article by Mr. Collins. There is no question in my mind but what the retirement point of a motor vehicle can be determined mathematically after having observed the operating costs of such a vehicle over sufficient period of time to determine the maintenance and operating cost trends. However, there are so many other factors that enter into the replacement of a motor vehicle that I doubt very much if any practical operator would rest his case on the theoretical determination alone.

I have used a method for years that can be expressed graphically, which I have found very helpful which briefly is as follows:

I am interested primarily in obtaining a straight line operating cost of the controllable items. The maintenance cost increases with increased number of years of service, and of the non-controllable items the depreciation decreases with increasing years. For economical operation the summation of depreciation plus maintenance should give a straight line curve or one that is bending downward. Plotting depreciation, maintenance, and the summation of the two you will find a crossing of the maintenance and depreciation curves. At and beyond this point is the questionable period in the economic life of the vehicle. Should the mainte-

• Five well-known fleet men and transportation engineers here give their views on this important subject. These views are part of the discussion of the article, "When Total Cost Per Mile Ceases to Drop, Replace the Truck," by W. T. Collins, assistant economist, R. H. Macy & Co., New York, published in the May issue.

*Views of 13 other fleet and factory men were published in the July and August issues. Considered as a whole, these opinions constitute the most interesting discussion of the truck replacement subject published to date because they reveal the many, varied factors involved which tend to complicate the working out of a universally acceptable solution.*

nance curve be increasing at a more rapid rate than the depreciation curve is decreasing, you will find your summation curve bending upward which indicates that your total cost of operation is in excess of the cost of a new unit.

I make no attempt to follow individual units by this method, however, it is used in connection with requests from the field for replacement.

### By A PRESIDENT

*Of a national bus operation who wants his name withheld*

MR. COLLINS' article is a most interesting one and presents a good theory for truck replacement.

In our business, however, the greatest single item to consider is obsolescence, as we are handling human freight and are to a large degree subject to its whims and fancies.

The second item which might possibly differ from Mr. Collins' theory is our ability to systematically rebuild our buses, thereby extending the intersecting point of the initial investment curve with the maintenance curve. It has been shown in our cost that the maintenance component probably extends at a smaller angle because of a necessity of closer observation in order to render a transportation service for passengers rather than for freight.

I imagine, in the final analysis, that his theory might be generally applied



# LIFE OF A TRUCK?

in our practices with the exception of the two items mentioned above, which might cause the curves to vary. Our 20 per cent per annum basis of depreciation has been effective and reasonable in our particular case and the ratio of low maintenance cost seems to lie directly with closer observation and periodical predetermined overhaul.



**FRED B. LAUTZENHISER**  
*Transportation Engineer*  
International Harvester Co.

**I**N my opinion both Mr. Collins and the C. C. J. are to be highly complimented for the carefully prepared and thought aggravating article in the May issue, entitled, "When Total Cost Per Mile Ceases to Drop, Replace the Truck."

We would hesitate to offer any comments without exhaustive study of the subject and considerable discussion and investigation among representative fleet operators.

We might mention in passing, however, that if the title of the article instead of reading—"When Total Cost Per Mile Ceases to Drop, Replace the Truck" were changed to read—"After the total cost per mile has ceased to drop and has again climbed to a cost per mile equal to that at which it originally went into service—then replace the truck," a further line of argument would be opened.

This is naturally assuming that the cost per mile being considerably higher when the truck first goes into service has a right to pass through the entire cycle of its operation cost drop to the bottom and to again rise to the same cost per mile as originally.

## By A SUPERINTENDENT

*Of bus operations whose name and address are available to readers who wish to question him further*

**I** HAVE given Mr. Collins' article a great deal of thought and believe that we in the bus industry may be considerably better off if such a mathematical formula for determining the economic point a vehicle has been used. The factor of obsolescence is not mentioned in the article, but in the bus industry is of particular importance. I have no doubt that a number of our older buses were disposed of prior to reaching the economic point because they were obsolete in appearance. There is no question but what a new vehicle attracts patronage to our business.

I have worked out charts (below) on

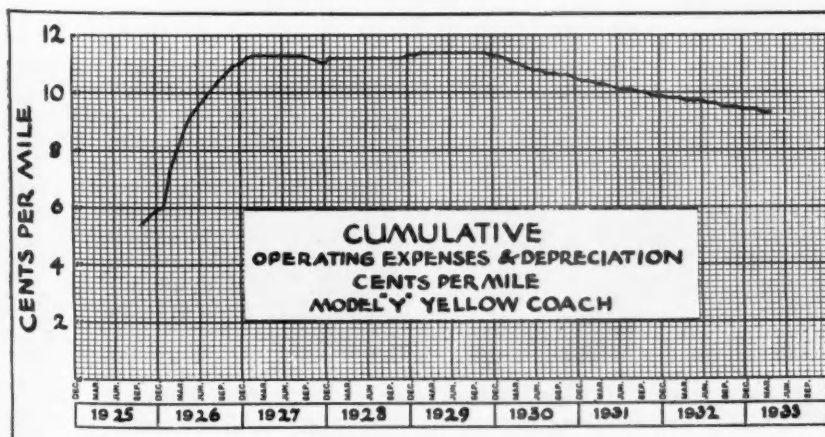


two groups of our buses, Group 1 being based according to Mr. Collins' theory of using the original investment plus cumulative operating expenses worked into a cumulative total cost per mile. I find that in the second year of the operation of this group of vehicles this cumulative cost per mile began to flatten out and to have periods of the same figure; and for the last 13 months this figure has been the same. If, from this chart, we have reached the bottom, then unquestionably we would be better off by replacing these vehicles now in order to gain the additional patronage which such new vehicles might attract—even though our cost over the next two years would be the same whether new vehicles were purchased or the old ones continued.

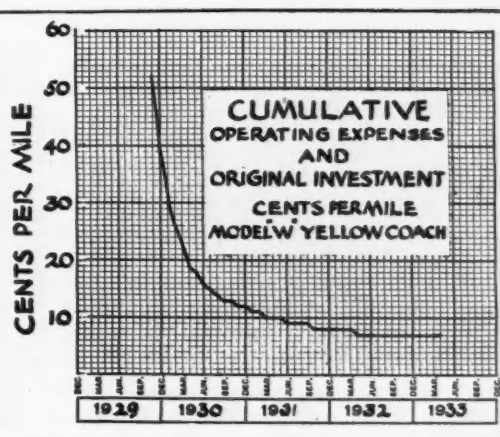
On the second group plotted, I have used a figure of operating and depreciation against cumulative miles in order to give a total cumulative cost per mile. In this curve the cost per mile figure increased steadily for the first year, then flattened out for three years, and since that time has been on a steady decrease for the next three years. Based on this chart, we are justified in continuing to run these vehicles even though they are not as attractive to the passenger as they might be.

I prefer that my name be not used.

Group 1



Group 2





# TRICKS WITH THE WELDING TORCH THAT SAVE MONEY ON MOTOR TRUCKS

## Part 2

By BILLIE BURGAN

*Fleet Superintendent*

HAGE'S ICE CREAM CO.

**T**HE welding torch, which the author, who is in charge of the fleet of Hage's Ice Cream Co., San Diego, Calif., calls the "Fire Fly" can be used to advantage for many operations in addition to welding.

Fender repairs, brazing oil lines, making special tools and loosening frozen parts are featured in this, the second article of a series. The third will appear in the October number.

**M**ANY mechanics know what happens when a soldered joint is twisted and therefore hesitate to trust solder very far. It is this distrust which causes us to braze the windshield wiper adaptor at the manifold and the copper oil pressure lines in the engine when they fail. For example, the  $\frac{1}{8}$  in. pipe nipple with  $\frac{3}{16}$  in. tubing brazed in it shown in Fig. 1, never works loose and aside

from the seasonal renewal of the rubber connection you'd never know it was on the vehicle.

For bronze welding copper, use a No. 5 tip—extreme low pressures, nearly noiseless flame—quick melting brass—train the breathing heat over and around the place—not too close—with small amount of flux—drop metal on the spot—withdraw flame slightly—repeat until fusion seals completely around the tubing. Bearings went out for want of oil and the windshield cleaner failed for want of suction, but we restored both permanently with the "Fire Fly."

### ● Fender Repairs

Front fenders are often victims of dents and tears and when pounded out refuse to take their former shape. The forward curve of a rear fender gets an elbowed dent and its rear, a tear.

To repair these injuries I cut the injured part away with the torch, bend the cut edge down with narrow nose pliers, then shape a patch to fit the opening, bending edges down, forming a V between patch and fender. Then

tack into place and fill the V, sealing the weld behind the flame. (See Fig. 2.) In either case this trick shortens the repair time because we fix them right on the vehicle.

### ● Making a Step

A skirted body such as the one pictured in Fig. 3 will make you talk to yourself without a step to help you get into it.

The way we solved this question was to insert a step in a hole cut in the skirt, using  $\frac{3}{4}$  x  $\frac{3}{4}$  x  $\frac{1}{8}$  in. angle iron for the arch hem and two pieces of  $1 \times 1 \times \frac{1}{8}$  in. for the step pad with one lip turned in, the other out and all welded together. After these steps were made we cut holes in the body skirt to fit each and fastened them in place with flat-head stove bolts.

To draw the pattern for the hole and the shape of the arch we set off the length of the base line and set two pins on the base line, one-eighth of its length from each end. Then we set a third pin at the top of the arch line and tied a string around the first pin, extended it over the top pin and

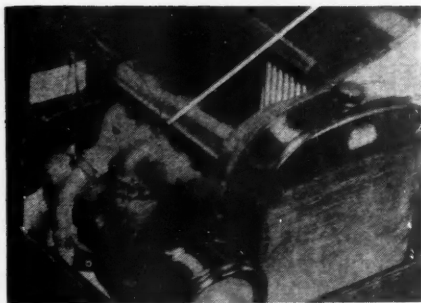


Fig. 1—Windshield wiper connection comprises a  $\frac{1}{8}$  in. nipple brazed to tubing

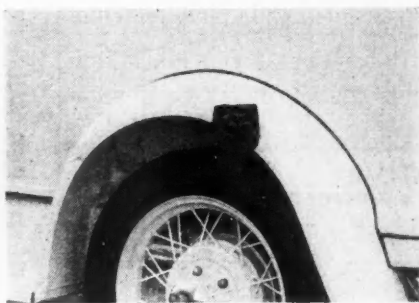


Fig. 2—Tears in fenders are repaired by cutting out a V and welding a patch

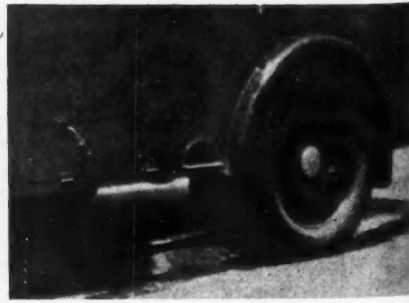


Fig. 3—Step on a skirted refrigerator body supplied by cutting and welding



Fig. 4—When a 10 ft. pry bar failed to dislodge a disk wheel after the nuts had been removed the welder overcame the rust by heating for 10 minutes

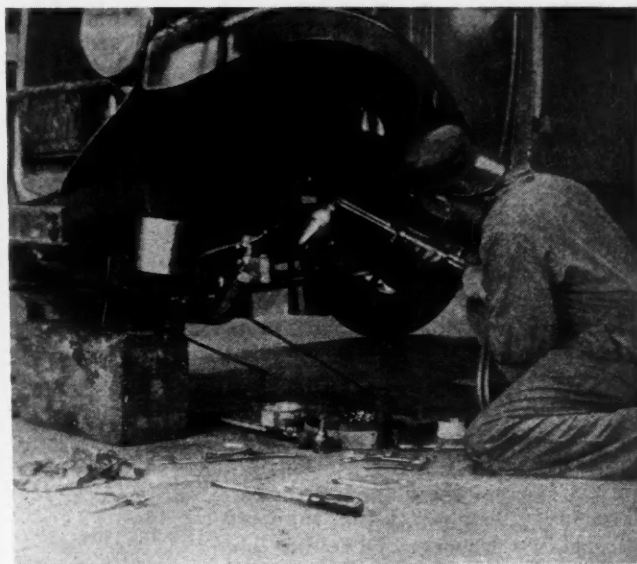


Fig. 5—Rivets on the front spring perch came loose and the welder blew the rivet heads off in a jiffy with the welding torch flame

ried it to the second pin. After removing the third pin we put a pencil inside the string and traced the curve. The actual dimensions were base line 5 in. height of arch  $1\frac{3}{4}$  in. two pins set  $\frac{5}{8}$  in. from each end.

Cut a piece of sheet metal to the shape drawn to use as a template. Hold the angle iron in the vise with flat side up. Heat the angle and bend progressively to form top of the step. Weld this arch to the lower section with lip turned out or in as desired.

#### ● Rivets and Crusts

The welder shown in Fig. 5 is ready to blow the heads off—not of rabbits—but loose rivets, so the front spring shackle perch can be bolted securely.

Imagine a Budd wheel with nuts removed, and a 10-ft. lever failing to pry it off. Name your penetrating liquid, we'll say it's good, but the torch is faster and more sure. A solid crust around the hub, dry as a cracker, was exposed in 10 min. after expanding the wheel with heat. (See Fig. 4.)

#### ● Making Long Drills

The top of an ice cream body

squirms and becomes loose. Expansion and contraction destroy the clamping ability of the hold-down screws. Permanent repairs on this work became easy after long drills, as in Fig. 6, were fashioned with the torch to make holes from top to bottom just inside the outer wall and through the insulating cork. Long stud bolts in these holes drew the top down, which saved refrigeration and improved delivery conditions.

We found too that body under structure and cross frame members could be reached quite handily with long drills of this type.

The extension on the drill should be smaller in diameter than the drill. We ream the ends of a piece of pipe to receive the drill. For a  $\frac{1}{2}$  in. drill we use  $\frac{3}{8}$  in. pipe. The drill has a  $\frac{1}{2}$  in. stub shoulder. This is put in the pipe and spot brazed through holes. On drills less than  $\frac{5}{8}$  in. we weld a rod right on the extension shank of the drill. Keep water handy and preserve temper of the drill by quenching after brazing or welding.

#### ● Body Work Tool

Panel bodies lined inside and cov-

ered outside with sheet metal are tough renewal work that can be conquered easily with a special iron to make way with the old sheets.

A pair of irons—right and left—as sketched, Fig. 7, thinned on the blade, will save skin and do the trick. Pay the "Fire Fly."

On one occasion, following a blow-out, a truck struck the curb and split the rim about 8 in. Now that was tire trouble, but a real saving was effected by the "Fire Fly." The rim was welded for about 75 cents. Compare that with the cheapest of rims and the torch wins hands down.

Times without number when a rust-bound tire was knocked down the rim latch fell out. The metal around the latch rivet was eaten, rust causing the trouble. Rather than lose the rim we either weld in stock for riveting or weld the rivet to the rim. By either method the cost is small and the saving big.

Swivel studs on spot lights work loose by frequent use. We have many of them and seldom lose one because we braze them or tack-weld the stud to the bowl sleeve.

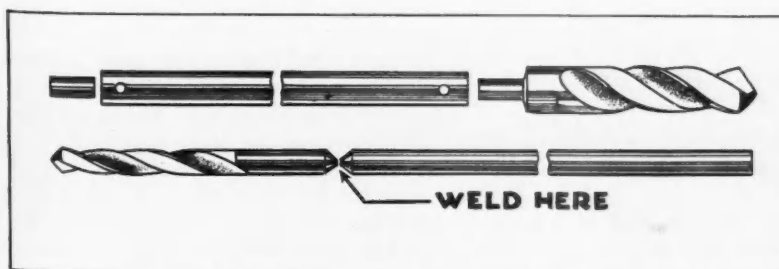


Fig. 6—Extension drills were formed by welding to bore holes through the sides of refrigerator bodies to permit use of through bolts instead of screws

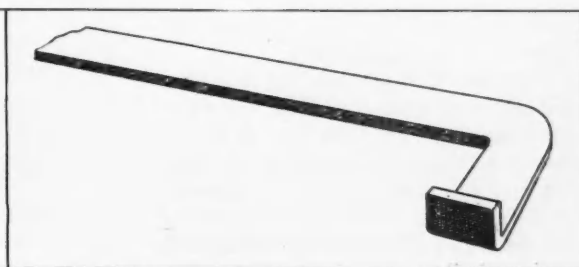


Fig. 7—Sheet metal lining and covering can be removed with ease by this tool, made right and left from bar stock



## Oil Changing is Just a Bugaboo With a Costly Trail

(CONTINUED FROM PAGE 20)

gasket developing a leak are merely the ordinary hazards we take as operators of large fleets. We have to depend upon a good job 99 times out of a hundred in gasket replacement the same as we have to depend on a good job in installing new ring gears and pinions, or new clutch facings, or in fitting bearings or wrist pins, or anything else. We certainly do not need to go to the expense of such frequent oil changes and analyses just to catch up on a poor head gasket job.

Fleet operators are interested only in operating their vehicles for the least possible cost per mile. To hold to this tenet everything relative to motor vehicle operation must be stripped of superficialities—we must get to the very bone of every problem confronting us. In getting to the nub of the lubrication problem, I have come to the conclusion that it is not really necessary to change oil at all during the life of a vehicle, under the conditions of operation which certainly seem to be approaching us.

The day is dawning when we are going to replace our light vehicles at from 35,000 to 40,000 miles, and our heavier units at about 60,000 to 70,000 miles. Recent cost studies tend to prove the economy of this procedure, so we will not go into detail. And, if we are going to replace our vehicles at this early period, we do not have to lubricate them with a view of obtaining twice that mileage from them.

Improvements in vehicle design are being made with startling rapidity. Vehicles are being equipped with oil filters and air cleaners of considerable value in preventing the entry of road dust into engines, and the filtering of dirt and carbon from the oil during circulation. Motor oil is decarbonized during its use and the carbon is mostly deposited in the engine head. The only remaining harmful ingredients in the oil, then, would be the dilution with the resultant lowered viscosity, and any acid content. The use of good gasolines with low sulphur content, and well-vented crankcases to prevent the formation of moisture, disposes of the acidity hazard.

Dilution, then, is our big bugaboo. We start off a new vehicle, for which the manufacturer tells us to use a certain viscosity oil required by bearing and piston tolerances, oil grooves, etc. Let us say in this case we are to use an oil of SAE viscosity rating 40. Under similar conditions we recently made an actual test of the used oil after 1000 miles of use and found 6 per cent dilution, which brought the

viscosity down to an equivalent of SAE rating 30. The oil was not changed, but fresh oil was added. The addition of fresh oil, admitted by Mr. Stewart, tends to build back the body, or bring up the viscosity. We actually added SAE 40. But in reality the addition of a quart of 40 oil to a crankcase nearly full of oil rating 30, would not bring the viscosity of the whole up to 40. But, supposing we made our additions of oil with a 50 viscosity rating? The result of the whole would be more likely to approach a 40 rating than by adding a quart of 40.

This matter was discussed with a chemist, who admitted that in this case by adding 50 oil to the 30 already in the case would undoubtedly tend to bring the viscosity close to 40, which is what we want to attain for our operating oil. The chemist admitted that he could see no reason why, from a chemical standpoint, the results would not be satisfactory. This would lessen the dilution on a percentage basis, and increase the oiliness of the oil.

Another point to be considered in this changing of oil is the carbon deposit on the engine head. Recently, we had 25 gallons of used oil which we had saved up re-refined through a process that was being demonstrated to us. The claim was made by this concern that the first use of the oil by the motor reduced the tendency of the oil to carbonize. In other words, the motor took all the carbon out of the oil during its first use. Their claim was that the oil, after use, having the dirt and gas ends removed, was better than new oil because it would not form a great deal of carbon. A test of the oil after it had been re-refined showed a very low carbon content, lower in fact than the new oil.

So, every time we change oil and put in a fresh batch of oil, we are adding a fresh deposit of carbon to our engine. If we do not change the oil, but add only such oil from time to time as is needed, we are adding then only as much carbon as may be derived from the additions of fresh oil which are relatively small compared to the oil put in at every change at 1000 or 2000-mile periods. Carbon causes valve grinds, so we may logically expect more valve grinds during the life of a car when oil is changed at frequent intervals than when it is not changed.

Under average conditions, then, we can arrive at the inevitable conclusion that:

If we are going to find it economical to replace our vehicles at a much earlier life, and

If the amount of increased wear due to old oil being replenished from time to time, but not changed, is not

going to cause any appreciable additional repair or maintenance expense during the comparatively short life of these vehicles, we are wasting good money to change oil, to test oil, and to keep the records for both.

## Operators Must Hit 4 Marks to Prolong Engine Life

(CONTINUED FROM PAGE 18)

reduced by as much as 25 per cent by simply adjusting the carburetor to a leaner mixture.

Sacrificing extreme acceleration for the sake of fuel economy would effect a saving in fuel of approximately 25 per cent, reduce carbon formation in the cylinders allowing probably two or three times as many miles between carbon removals, decrease cost of up-keep because less frequent overhauls will be required, insure freedom from crankcase dilution and reveal a smoother running engine with less tendency to knock.

Exhaust gas analyzers indicate what should be done to the carburetor to give the proper air-fuel mixture required for economical operating. An air-fuel ratio of about 15 to 1 gives best combustion and 14.7 per cent carbon dioxide will be found in the exhaust gas. When the air-fuel ratio is 12 or 9 to 1 the percentage of carbon dioxide found in the exhaust gas will be 9.4 and 5.7 respectively. The exhaust gas analyzers indicate the proper carburetor setting by showing the air-fuel ratio in terms of unburned fuel.

The most serious form of oil contamination is road dust and grit which gains access to the working parts of the engine through the carburetor. If the air supply is kept clean this does not occur. A good air cleaner should be on every vehicle.

Because oil is a poor conductor of heat and the period of combustion in the cylinder is of very short duration, only a portion of the oil film on the cylinder wall is burned at the time of cylinder firing. Heat to which this remaining film of oil is subjected determines the severest requirements made on the lubricating oil. Even if the radiator of the vehicle is at the boiling point the temperature of the remaining or inner film of oil on the cylinder wall, after the outer portion has been burned away due to the firing of the cylinder, is only about 270 deg. F. One side of the cylinder wall is covered with water and the law of transfer of heat indicates that the temperature of oil remaining on the inside of the cylinder wall could only be about 270 deg. F. with a water temperature of 213 deg. F. So far as flash and fire points are concerned, any oil

(TURN TO PAGE 40, PLEASE)

## Comments from Readers of

### THE 90-DAY GUARANTEE

IN writing you it sometimes strikes me that—"Here is how the fellow must feel when he puts his message in a bottle and heaves it overboard". At any event, I enjoy the splash no end, so here goes—

It's about the guarantee on trucks which I believe is something that will be or is being glossed over in all the talk about unfair competition. I don't believe the N. A. C. C. is interested—they have a 90-day guarantee and we and everyone else totally disregard it. I think I remember that the pleasure car people recently started to credit labor as well as parts under guarantee. We also have to worry about accessories.

My idea is that 90 days won't fit.

On a recent bus proposal we were up against an 85,000-mile guarantee on clutches and 200,000 on cylinder blocks.

My idea is that we should guarantee buses on say 100,000-mile basis. That is, they pay for parts on the percentage run up to 100,000 miles.

On trucks it would be on ton-miles—if the loads go up the mileage comes down. For instance, I figured that we were giving cylinder blocks away to one customer in the first year when the ton-miles operated by the unit equalled what it would take one of our old jobs  $6\frac{1}{2}$  years to do. Imagine someone bringing in a 6-year-old cylinder block for credit!

On buses where city type jobs make some 3000 gear changes a day there may be some question as to whether they should get as long a guarantee. This could be arranged and I also feel that inert or load-carrying members should be perhaps longer under guarantee than torque or wear members. After 50,000 miles you see we'd have our costs back at least.

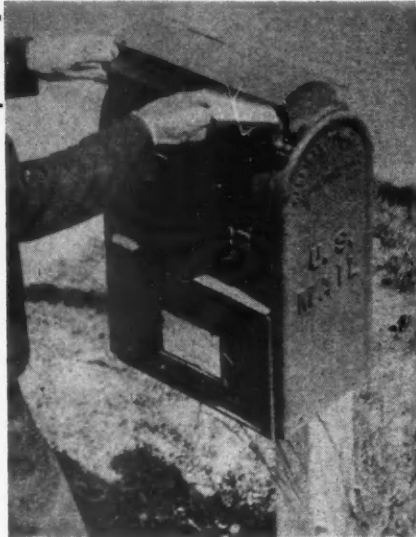
Under any consideration the basis is ton-miles (this semi-trailer business is tough) and not this hypocritical 90-day clause which is so piously preached but never practiced. I think it's a big part of a fair competition code and vital to ours and the customer's welfare.—*A Transportation Engineer.*

### TRAILER CODE STOPS THIS

THIS may be a little out of line, but it is getting to be a very serious matter with the truck dealers, and that is the trailer manufacturers selling retail at wholesale prices, and while they not only knock some dealer out of a day's pay, they also make the dealers look like chisellers, when the chiseler is the trailer manufacturer.

Only recently we were trying to sell a certain semi-trailer, and the customer wrote to the manufacturer who immediately quoted and sold at wholesale price. Now the same customer (whom we have sold three trucks) wants to buy trucks at 26 per cent discount or same as the trailer maker sold him.

I think at this time when the new deal



## POST SCRIPTS

is being spread and shorter hours are bound to come for the service station, that such items as above mentioned should be exposed, and then maybe the new deal will see that the chiseler manufacturer plays a square game or sells direct to everyone, with no dealer prices.—*E. D. Tyler, The E. D. Tyler Co., Portland, Maine.*

### BRAKES, SAFETY, CODES

TO my way of thinking we are never going to have safety on the highways until we have regulations regarding size of brakes and power according to tonnage carried. This kind of regulation would immediately place every outfit on a square basis. Companies who hire trucks for inter-state hauling are very anxious to put the light outfits to work with no regard to the overloads, so that the owner can make a good showing for the first three to six months. Then when he has breakdowns and of course cannot meet his notes, he is cut out as being undesirable and another sucker is looked for to take his place. The man with the correct outfit, which of course weighs more and costs more to operate, does not get the rates, but if the regulation on brakes and power were forced then the small outfits would either have to carry a smaller tonnage or else buy a better outfit which would also solve many accidents caused by inadequate brakes.

The safety factor alone is going to have something to do with the regulation of motor trucks. We are having entirely too many accidents and of course they are not all due to overloading and insufficient brakes. A lot of it is due to insufficient sleep and if there is any one thing in this

## Commercial Car Journal

new recovery act that will be of tremendous help to motor trucks it will be the enforcing of hours of work.

To my way of thinking the whole matter could be greatly simplified. What it needs is a few men of real downright experience and then establishing a code of costs and operation as to hours and pay, and then when that is done will come the final test of enforcing the code. That is the one great experience we have not gone through yet, and as one writer has put it, this is not just another deal, it is an entirely new game. The pot, however, is recovery, jobs, purchasing, orders and it is worth playing for either lose, win or draw, because any game is better than ring-around-the-Rosie and hide-and-seek, which is only going to completely put us all out of business.—*B. A. Gramm, President, Gramm Motors, Inc., Delphos, Ohio.*

### HELP! HELP!

WHILE awaiting a few details to be accomplished in connection with the adoption of a Code for our locality, our Auditing Department is concerned in the preparation of Pay Roll Sheet suitable for our business.

We operate a fleet of 40 White trucks and 50 trailers and supply the amount of time earned by each employee in a sheet showing such items daily and when extended represent the amount of money earned by said party.

What I would now like to obtain is several similar sheets from folks engaged in our line of business elsewhere, from which we can improve our system and at the same time readily tell the pay-roll costs.—*F. Marion Sheen, Dennis Sheen Transfer, Inc., New Orleans, La.*

### WEREN'T WE ALL?

WE feel that we receive a good return on the investment in the *Commercial Car Journal*, but wonder why each issue seems to be a little thinner than the previous one. However, we don't seem to miss much value and think there is just as much valuable reading as before. We like your new legal department very much and think it one of the best features of the magazine.—*H. B. Botell, Jr., Office Manager, L. N. Hevenor (Trucking), East Hartford, Conn.*

### WE PRIZE THIS POSEY

IN regard to your *COMMERCIAL CAR JOURNAL*, wish to say I have been reading and benefiting by same for some years. I am not a subscriber, however, but have been getting copies from some of my various connections. I have come to rely a great deal on this magazine and was very pleased to receive the fine copy for August.

I must say you surely "know your stuff".—*Bernard Dreier, Bridgeman-Russell Co. (Dairy Products), Duluth, Minn.*



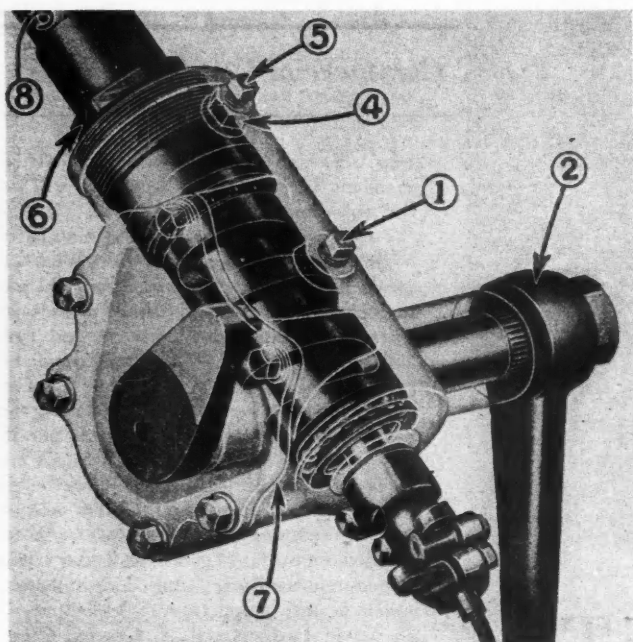


Fig. 1. End play in shaft of this type gear is adjusted by shims under the side cover

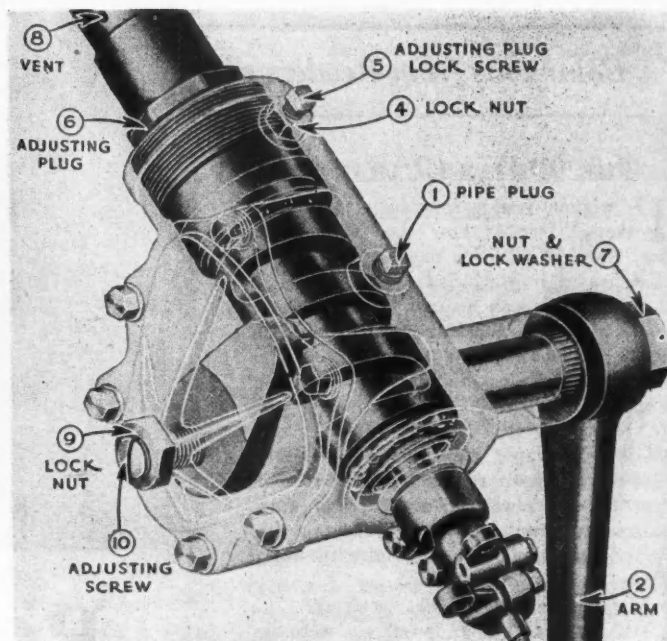


Fig. 2. In gears of this type the adjusting screw 10 takes up end play of the cross shaft

## Straight Steers on Adjustment of Ross Steering Gears

**A**LL mechanics realize the danger of allowing a loose connecting rod bearing to keep on pounding. Even a short run will pound the bearing all out of shape and a longer run may result in sunlight entering the crankcase.

Although the penalty of allowing a steering gear to run with too much play is not so obvious or severe the fact remains that looseness allows a pounding action which shortens the life of all moving parts in the steering gear assembly.

Keeping a steering gear in adjustment does not mean tightening the bearings and the actuating parts too tight in order to reduce shimmy. Such tightening puts a terrific load on bearings and moving parts and they wear abnormally. Shimmy and other front end troubles should be cured as front end troubles and the steering gear put in proper adjustment as a steering gear, not a steering system brake.

There are but two adjustments to the three types of Ross steering gears, excepting the adjustments of the bearings of the roller bearing mounted

Taking up the end play is easily done with only two adjustments that will result in longer gear life

stud, which are not to be disturbed unless necessary. The two adjustments are (1) to adjust bearings to take up end play and (2) to adjust lever shaft or stud position to take up end play. The adjustments should always be made in order named, bearings first, shaft second.

### • Before Making Adjustments

Before adjusting any one of the three types of Ross steering gears, perform these two operations:

1. Disconnect drag link from steering gear, preferably by removing drag link rear ball socket in most cases. Follow the instruction book of the vehicle maker as there are several special constructions in use.

2. If the jacket tube is held in the

adjusting plug by means of a clamp bolt, loosen the bolt. If there is no clamp bolt the tube is pressed into the plug and the dash bracket clamp must be loosened so that the tube will turn when the adjusting plug is turned.

### • Bearing Adjustment (Figs. 1 and 2)

To adjust thrust bearings to take up end play in steering wheel tube of gears with one-piece housing as in Fig. 1:

Back off the housing side cover screws several turns.

Back off lock nut (4) and lock screw (5).

Turn adjusting plug (6) until a slight drag is felt when turning the steering wheel, then back off plug (about 1/6 of a turn) till wheel turns freely but not enough to allow of any up and down movement of wheel tube.

Tighten lock screw (5) and lock nut (4). Turn wheel to make sure that adjustment has not changed.

### • Shaft Adjustment (Fig. 1)

To adjust housing side cover to take up lever shaft play in and out:

Adjustment is made possible by the



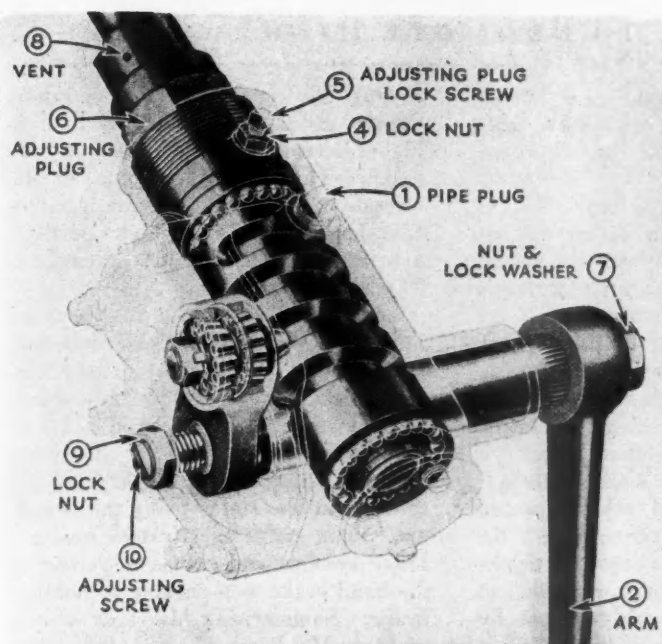


Fig. 3. Backlash, which appears as shaft end play is adjusted by screw 10 with gear in mid-position

taper on the stud of the lever and a corresponding taper of the sides of the groove in the cam. The greater wear toward the center is compensated for by making the width of the groove narrower toward the mid position.

Adjustment for in and out movement or end play of the lever shaft is made at the narrowest part of the cam groove. The exact location of this narrow part is not important so long as it occurs within the ordinary driving range.

Remove all but two diagonally opposite housing cover screws.

Turn the steering wheel as far as it will go in one direction. This brings the stud into a position where there is no danger of damaging the cam when drawing down the side cover plate should too many shims be removed.

This must always be done before assembling the side cover plate.

Remove these two cap screws keeping the side cover, gaskets and shims (7), against the screw heads so that the shims and gaskets will not drop off. Use a rag to catch the grease from the housing.

The shims are .003 in., .007 in., .014 in. thick so that any desired adjustment is possible. The gaskets must not be used for making adjustments as their purpose is to prevent leakage of the lubricant. One gasket is used against the flange of the housing and the other against the cover, with the shims between the two. Remove a .003 in. shim (7).

Reassemble side cover, shims and gaskets, using the two cap screws to draw the cover plate down tight against the housing.

Turn the steering wheel slowly from

one extreme to the other, testing the end play in the lever shaft at various points as you go along.

Continue to remove shims until a slight draw is felt when testing the gear. The gear must not bind any place and only a slight drag should be felt.

When the proper adjustment has been made, assemble the remaining cap screws (with a lock washer under the head of each screw) and test the gear before leaving this operation, as tightening the screws may change the adjustment slightly. Be sure that the minimum end play is .003 as this is necessary for lubrication. This is important.

#### • Connect Gear to Vehicle

Make sure steering gear ball arm (2) is tight on the splined shaft and that the lock washer and nut are tight also. Tighten adjusting plug clamp bolt or dash bracket clamp. Turn wheel to see if the gear turns harder. If it does the steering column is out of alignment. In that case loosen dash bracket and, if it is necessary, frame bracket, and align gear. It may be necessary to shim the dash bracket.

Turn the steering wheel as far to the right as possible, then rotate the wheel in the opposite direction as far as possible and note the total number of turns. Turn the wheel back just one-half of this total movement, thus placing the cam lever in the mid-position. Place the front wheels in position for straight ahead driving. It should then be possible to connect the drag-link to the ball on the end of the

steering gear arm without moving the gear to any appreciable extent.

#### • Shaft Adjustment (Fig. 2)

To adjust housing side cover to take up lever shaft play in and out (Fig. 2):

Tighten side cover adjusting screw (10) until a slight drag is felt when turning the steering wheel slowly from one extreme to the other. Test the end play of the lever shaft at various points as you go along.

When the proper adjustment has been made, tighten the lock nut (9) and test the gear before leaving this operation, as tightening the lock nut may change the adjustment slightly.

Toward either end of the cam the end play will increase because the groove in the cam widens, thus permitting the stud to ride deeper in the groove. If the front end of the vehicle is in proper condition this will not affect the steering. This increased end play in the extreme positions is not objectionable.

The steering column should be checked and the steering gear connected, as directed for the one-piece housing gear.

#### • Bearing Adjustment (Fig. 3)

To adjust thrust bearings to take up end play of cam in gears with roller bearing mounted studs, Fig. 3:

End play of cam shows up as end play in steering wheel tube. Before making this adjustment loosen the housing side plate adjusting screw (9, 10) to free the stud in the cam groove. Back off lock screw (4, 5) and turn adjusting plug (6) until a slight drag is felt when turning the steering wheel, then back off plug (about 1/6 of a turn) till wheel turns freely without any up and down movement of wheel tube. Tighten lock screw and nut.

#### • Stud Adjustment (Fig. 3)

To adjust tapered stud of lever in groove of cam for backlash:

Backlash shows up as end play of lever shaft.

The groove is purposely cut deeper in the ends than in the mid-position. This permits take-up of backlash in the mid-position, even after normal wear of the groove, without causing a bind in the ends.

Adjust to this mid-position high range not in the end positions.

Tighten side cover adjusting screw (10) until a slight drag is felt through the mid-position high range when turning the steering wheel slowly from one extreme to the other. The gear must not bind any place.

When the proper adjustment has been made, tighten the lock nut (9) and give the gear a final test.

Make sure steering gear ball arm (2) is tight on the splined shaft and that the lockwasher and nut (7) are tight also.

## BRAKE CAPACITIES MAY BE RATED TO PROMOTE HIGHWAY SAFETY

(CONTINUED FROM PAGE 14)

Remembering the active part which Mr. Bachman took in the S.A.E. truck rating committee readers of Commercial Car Journal will not be surprised to learn that he boldly proposed a rating for truck brakes, one form of which is given in the poster at the head of this article. He presented the rating formulas, "not as a complete program, but rather as a target to invite comment, criticism and constructive thought." All of which will no doubt ensue.

Step by step he built up the formula. He first showed how to figure the energy in a moving vehicle, which energy must be dissipated to stop it. The next step was to calculate the brake torque from pedal pressure, ratio of the mechanical or hydraulic mechanism, coefficient of friction of lining, and the effective brake radius.

Continuing the analysis, Mr. Bachman suggested a formula for determining the ability of the brakes to stop the vehicle based upon the vehicle weight, diameter of the brake and of the wheel and the power applied to the brake. But this formula "gives no indication as to whether the brake is adequate in size to be satisfactory as to wear."

The factor of life should not, in Mr. Bachman's opinion, be overlooked. The area of the lining is important and he

included it in the formula for relative brake life by dividing each of the three factors in the formula by "A" representing lining area.

In the formula BL is brake life,  $v_1$  the initial speed when brakes are applied,  $v_2$  final speed down the grade, W is weight, A is net area of lining and the final figure is the sine of the grade angle multiplied by the distance over which brakes are applied.

The ability of the brakes to absorb and radiate heat, which is important on long grades, is not included because it is "too complex to treat satisfactorily."

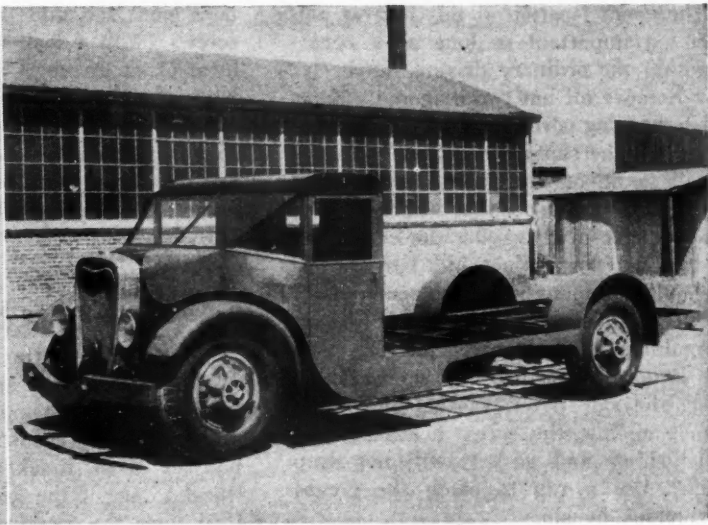
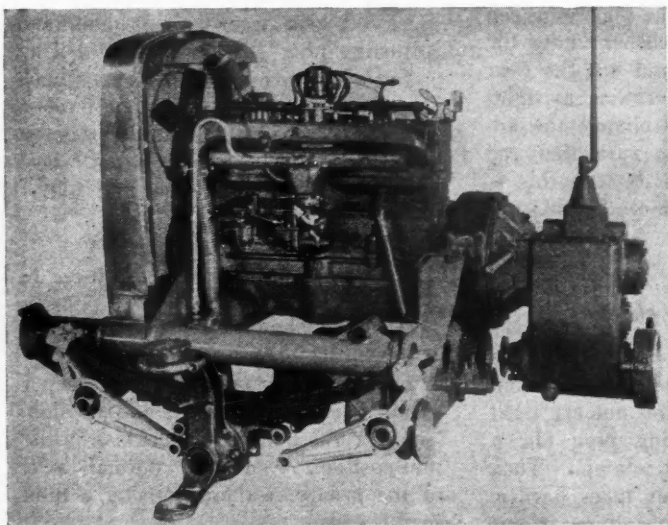
Showing how actual vehicles would be classified for brake rating, Mr. Bachman gave facts about six trucks ranging in gross weight from 16,000 to 30,000 lb. Dividing gross weight by brake lining area gives figures from 35.5 to 46.3 which shows the weight per square inch of lining area. Brake effort expressed as ft. lb. torque per square inch of lining ranges from 1650 to 4050. Foot pounds per square inch per second "which brings speed into the rating and gives a better result for comparative purposes" and this figure ranges from 125 to 140.

During discussion of the paper it was suggested that pedal pressure should be included in brake rating and

it was also suggested that stopping ability should be determined from higher speeds than the customary 20 m.p.h. The rate of stopping, or deceleration, might be the same in either case, but stopping from high speeds is a more comprehensive test than from 20 m.p.h.

Looking at legislative requirements for brakes Mr. Beecroft finds confusion, contradiction and lack of definiteness. Only recently have states set up standards of stopping distances in place of the indefinite "adequate" requirement. Stopping distances are not uniform throughout the states using this standard. Some states specify two separate brake systems and refuse to recognize the hand brake as a parking or holding brake. Summarizing his study of the problem Mr. Beecroft concluded: "The best brakes will not make the operator attentive or perhaps a better driver but a brake code uniform in all states and competently enforced will accomplish much by way of greater highway safety."

A start has been made in the task of setting up standards which may be followed generally. Fleet operators should play an important part in the establishing of standards based upon actual operating experience.



**T**HE Curtis-Bill truck, shown above, carries gross rating of 22,000 lb. with a chassis weight of only 6000 lb. Model 15FR, which is the first of a series to be produced by Bill Motors Co., Oakland, Calif., embodies front-wheel drive and low loading height. Chassis price is \$3,150.

The cab is placed unusually far forward, with sharp angle on the windshield, with the driver seated beside a cover over the transmission. As a result, the cab to rear axle distance is 114 in. on the 170-in. wheelbase.

Constructed of tubes and steel plate

### Novel Design Ideas in New Curtis-Bill Truck

cross members, the frame supports the body without sills. Two tubes are 4 in. in diameter; two are 2 1/4 in. in diameter.

The Lycoming 8-cylinder, 3 x 4 3/4 in. engine drives through a Brown-Lipe clutch and own make three-speed transmission to a gear-driven third shaft. The front drive axle has bevel gear at the center, drive shafts through the hollow housing and spur gear drive to the

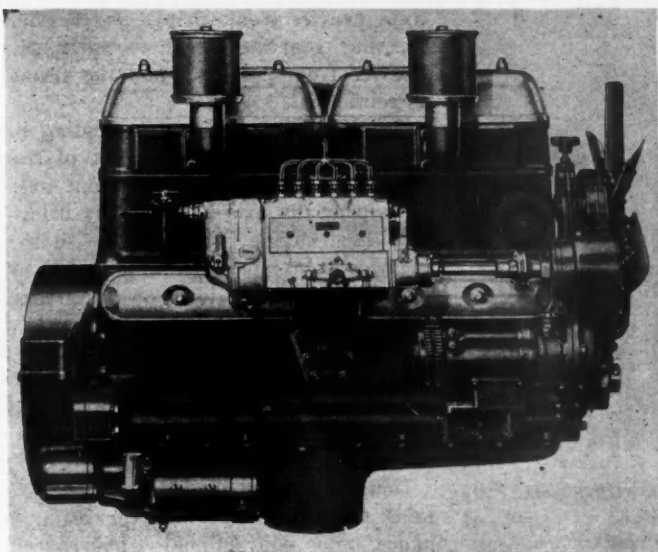
wheels. Axle ends are forked and carry the spindle assemblies in roller bearings.

Ends of the semi-elliptic springs slide in the ends of rocker arms which are pivoted on tubular arms and which are attached to the axle by pins, as shown above. Springs are 52 x 2 1/2 in. front and rear.

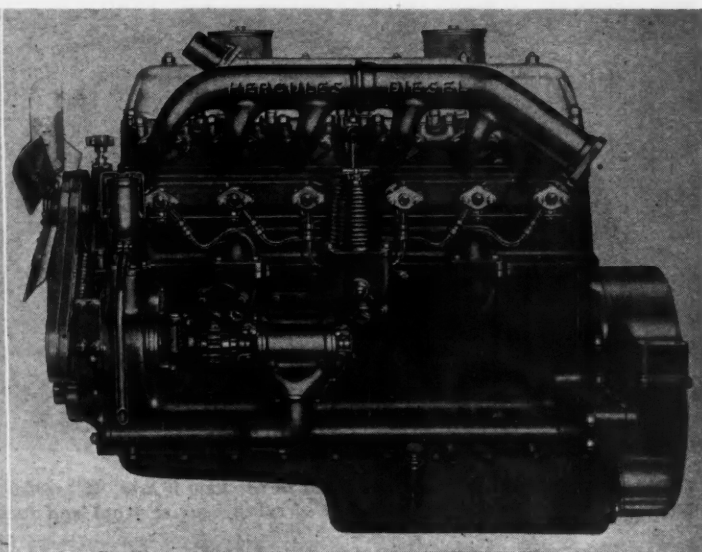
Brakes are Lockheed hydraulic actuated by vacuum power unit.

Curtis-Bill trucks will be available with front-wheel drive, rear-wheel drive or four-wheel drive as required for operating conditions.





*Bosch or Compur fuel injection pumps are used*



*Injector nozzles are placed on left side of engine*

## Hercules Diesel Is Wet Sleeve Type with 188-Hp. Rating

**H**ERCULES MOTOR CORP. has developed a six-cylinder diesel engine developing 188 hp. at 2000 r.p.m. which is interchangeable in mounting dimensions with the HX series of gasoline engines. This engine was offered as optional at an additional price in six models of the new Marmon-Herrington line, which was described in the July issue.

Cylinders measure 5 x 6 in. giving piston displacement of 707 cu. in. The cylinders are wet sleeves sealed with copper asbestos gaskets at the top, and rubber rings at the bottom. Overhead valves are carried on a hollow shaft and actuated by rocker arms and push rods.

The seven-bearing crankshaft is of the underhung type and is supported by the crankcase, which is made of either aluminum or cast iron, and which extends four in. below the crankshaft center, thus forming a deep tubular rib to give side stiffening to the case and to which is bolted a pressed steel oil pan. The crankcase supports a one-piece, cast-iron cylinder block and two cylinder heads, each covering three cylinders.

Through bolts from the main bearing caps pass through the crankcase, cylinder block and heads to clamp these members rigidly together and

### *Details of the Diesel*

- Six cylinders, 5 x 6 in. carried in removable block, piston displacement 707 cu. in.
- Power output is 188 hp. at 2000 r.p.m.
- Fuel injection is by either Bosch or Compur pump.
- Overhead valves are mounted in two separate cylinder heads, one for each three cylinders.

carry vertical stresses from the cylinder heads to the crankcase. The eccentric heads on these bolts, which are located in recessed holes in the top of the crankcase, prevent the bolts from turning when the main bearing nuts or the cylinder head nuts are drawn up.

The camshaft is driven by gears, and a silent chain drive at the front of the camshaft gear drives the fuel pump at half-engine speed. The fuel pump is mounted on the right side of the engine below the exhaust manifold, and the fuel delivery tubes lead from the pump to the nozzles, which are located on the left side of the engine and pass between the cylinder heads. Either a Bosch or Compur fuel pump may be installed.

The fan is belt driven from a pulley on the extended water pump drive shaft, and, when an air compressor is

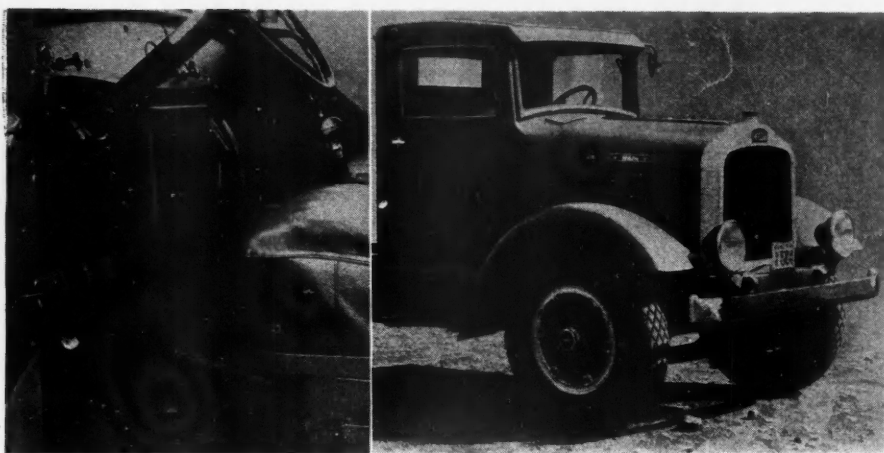
supplied, it is mounted on a bracket attached to the gear cover and belt driven from the same belt that drives the fan.

Main and connecting rod bearings are of removable steel shells lined with a high lead bronze alloy. The connecting rod is rifle drilled to carry oil to the piston pin, which is of molybdenum steel, full floating and held in place by aluminum buttons in the piston. The piston is provided with four compression rings and two oil drain rings, one above and one below the piston pin.

The crankshaft is drop forged from chrome-nickel molybdenum steel. It is drilled for connecting rod bearing lubrication and arranged with an oil seal at the flywheel end of the usual Hercules patented design. An oil thrower and a cork and a felt seal ring clamped into place in the trunnion of the gear cover seals the forward end of the crankshaft.

The DX1, as the diesel model is designated, will develop from 100 hp. at 1000 r.p.m. to 177 hp. at 1800 r.p.m. and 188 hp. at 2000 r.p.m. The fuel consumption is .383 lb. per brake horsepower per hour at 1000 r.p.m., .430 lb. per brake horsepower per hour at 1800 r.p.m., and .46 lb. per brake horsepower per hour at 2000 r.p.m.





*The engine extends through the dash in the new White "K" series modifications of six standard models carrying heavier front end loads*

## White "K" Models Shift More Load to Front

**T**HE White Co. has modified six standard models to carry more of the weight of payload and body on the front axle than with standard models of the same wheelbase and thus to be allowed to carry more weight in

states imposing a limit on axle loads.

Designated the "K" series, the new models corresponding to Models 630, 631, 640 and 641 have the cab closer to the front axle by bringing the engine through the dash. A heavier front

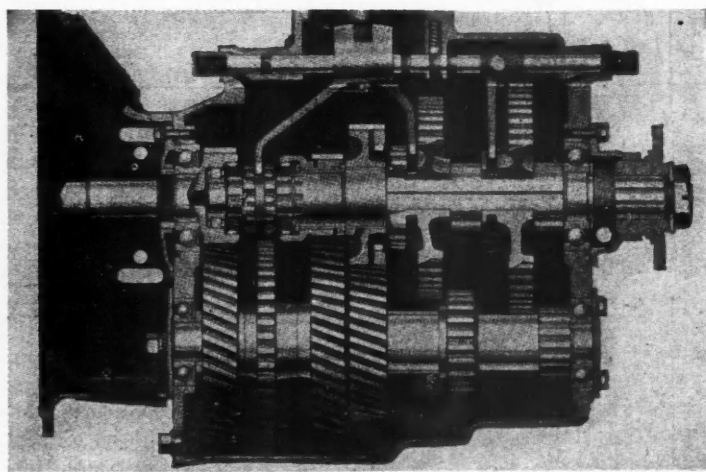
axle, heavier front springs and heavier steering gear are used to carry the heavier front-end load, and the frame is reinforced.

In the "K" trucks corresponding to Models 612 and 618 the back of the cab is placed closer to the front axle by moving the axle back and by bringing the engine through the dash. Heavier front springs are provided to carry the heavier load on the front tires.

The dash is insulated and air is circulated by a duct extending from in back of the fan between the engine and the dash to prevent overheating of the cab and driving compartment.

Construction of the new models retains accessibility of unit for maintenance and conventional appearance. Trucks or truck-tractors now in use may be converted to the "K" design without excessive cost.

Comparison of Model 612 with 612K shows that the gross of 13,010 lb. for the former is distributed 3600 lb. on front axle and 9410 lb. on rear axle, with payload of 5700 lb. and assumed body weight of 1400 lb. Model 612K, carrying 1000 lb. more payload and same body weight, has gross weight of 14,060 lb. distributed 4260 lb. front and 9800 lb. rear. This is an increase of 1660 lb. in front axle load for a truck with the same cab to axle dimension as the standard model.



## Two New Fuller Five-Speeds

*Fuller five-speed gear sets have three pairs of helical gears*

**T**WO new five-speed transmissions, the 5-A-530 and 5-A-53, are presented by Fuller & Sons Mfg. Co. to replace the models VU and VUOG. All speeds, including the optional high reverse, are controlled by one gear-shift lever. These two transmissions are designed to handle torque of six-cylinder engines up to 530 cu. in. piston displacement in trucks with maximum chassis weight of 9000 lb.

Construction follows the same basic

design as models 5-A-380 and 5-A-38 introduced early in the year. These models are intended for use in trucks with chassis weight up to 6500 lb. and with engines not exceeding 386 cu. in. displacement.

Model 5-A-530 is the overdrive version of the new series, and it contains three sets of helical gears for quiet operation. Shifting clutches have staggered ends to assist engagement. Low reverse is standard, but a high reverse

is optional. Torque capacity of this unit is greater than the preceding VUOG.

Model 5-A-53 follows the same design as 5-A-530, the principal difference being that this model has direct drive on fifth, instead of fourth. All parts of this transmission, except the three pairs of helical gears, are interchangeable with corresponding gears in 5-A-530. This unit replaces model VU.

The direct-in-fifth model of the smaller transmissions is the 5-A-38. It, too, has helical gears in third, fourth, and idling in direct.

Ball bearings are used both front and rear on main and countershafts. Reverse idlers are bronze bushed. Shafts are case hardened, and cases are made of nickel cast iron.

# COMMERCIAL CAR JOURNAL NEWS

## July Output 'Way Ahead

Truck production in July, according to the Bureau of the Census, totaled 39,283 units in the United States and Canada, as compared with 15,137 units in July, 1932. Truck production for the first seven months of 1933 was 202,562, as compared with 161,464 in the corresponding period of 1932. August production is expected to show a similar gain over August, 1932.

## Billion Gain in Farm Income

Gross farm income will approximate \$6,360,000,000 this year compared with \$5,143,000,000 in 1932, assuming a continued improved demand for farm products the remainder of this year, according to a preliminary estimate by the Bureau of Agricultural Economics. Most of the increase is attributed to better prices for crops, since prices of most types of livestock have averaged slightly lower this year than last.

## Trucks Gain in Grain Hauls

Motor truck transportation has become an important factor in the marketing of grain in recent months, according to reports issued by the Corn Belt Farm Dailies in its survey of the agricultural situation. At Chicago an increase of 710,015 bushels, or 368 per cent, in truck receipts was recorded for the first six months of 1933 over the last half of 1932. The report states, "the truck, a major factor in livestock marketing for some time, is now coming into prominence in the handling of grain."

## Ford Output Held High

Production of Ford cars and trucks in September has been scheduled at the same high daily rate as in August, when production was the greatest for the year to date. The retail sales volume of Ford trucks in August was the largest since October, 1931. The daily sales volume in August is being maintained in September.

## Dodge Gain Is 95%

According to J. D. Burke, director of Dodge truck sales, deliveries by Dodge dealers for the week ending Sept. 1 totaled 876 units, ranging from ½-ton light delivery models to nine-ton heavy-duty units and trailer combinations. Deliveries from Jan. 1 to Sept. 1, 1933, amounted to 12,424 trucks as against 6370 in the corresponding period of 1932—a gain of 95 per cent.

## Kidnapper-Killers Sentenced

The four confessed kidnapers and killers of Joseph Nesbitt, 45, service manager for the Autocar Sales & Service Co., Detroit, Mich., were sentenced Saturday to serve from 45 to 90 years for kidnaping and life imprisonment for murder, the sentences to run concurrently.

## A C Spark Plug Gains

A C Spark Plug Co. has reported an August sales gain of 185 per cent in dol-

lar volume and a payroll increase of 230 per cent over August a year ago. August sales equaled those of July this year. Employment approximated 4000 workers, an increase of 70 per cent over August last year.

## 4500 Engines for I.H.C.

Production has been resumed at the plant of the Wilson Foundry & Machine Co., Pontiac, on engines for Willys-Overland, to be assembled into trucks for the International Harvester Corp. It is reported the order calls for approximately 4500 units, which will be spread over about two months. In resuming, Wilson made effective a 20 per cent wage scale increase.

## Studebaker Shows a Profit

During the second quarter ended June 30, 1933, Studebaker not only produced a net operating profit of \$187,492.84, but also succeeded in adding \$1,368,787.33 to its cash account, which totals \$2,406,788.87.

## Perfection Acquires E-B Unit

The Perfection Steel Body Co., Gahon, Ohio, announces the purchase of all patterns, stock and equipment of the well-known E-B third axle unit from Emerson-Brantingham Corp., Rockford, Ill. This unit for 1½-ton trucks, added to the complete line of steel bodies and hoists, gives Perfection an important place in the truck equipment field. Manufacturing has begun on new units, and present owners and distributors are instructed to direct all communications relative to E-B Units to Perfection.

## G.P.A. on the Radio

A nation-wide campaign of radio broadcasting will blanket the country daily this fall and winter with messages on G.P.A. Radiator Glycerine, according to an announcement just made by the Glycerine Producers' Association. More than 65 stations located strategically throughout the freezing belt, have been engaged to supplement the schedule of color-page advertising in national magazines. The association will sponsor the official weather announcement for the day and build the sales message around it.

## Dodge Offers Free System

Purely to point the way to more efficient cost records in commercial motor vehicle

operation, J. D. Burke, director of truck sales of Dodge Brothers Corp., offers to mail a copy of an interesting and valuable book to anyone writing for it. The book is a complete record and bookkeeping system for the motor truck and passenger bus owner.

## Chevrolet Alters Hook-Up

A new parking brake hook-up has been released for production on Chevrolet 1½-ton trucks which cuts in the service brake shoes as well as the parking brake shoes when the hand-lever is pulled back. Installations of this brake system can be simply made in service by replacing the service brake cross shaft and hand brake pull rods with new units.

## Bottlers Meet Oct. 9-13

The Annual Convention and Exposition of the American Bottlers of Carbonated Beverages will be held in Louisville, Ky., Oct. 9-13.

## Cleary with Ad Agency

James M. Cleary has been appointed vice-president of Roche, Williams & Cunningham, Inc., widely known advertising agency. Mr. Cleary recently resigned as president of The White Co.

## Cole Is Chief Instructor

Hugh S. Cole, a veteran of the Bendix service department, has been made chief instructor of the Bendix Service School, South Bend, Ind. The school is free to any legitimate service employee in America. The course covers proper servicing of all of the many Bendix products for passenger and commercial cars.

## Whiteman Lycoming Sales Manager

Z. H. Whiteman, Jr., has been promoted from assistant sales manager to sales manager of the Lycoming Mfg. Co., a division of the Cord Corp. Mr. Whiteman's promotion precedes an extensive sales campaign. He will be in complete charge of the sales of the entire Lycoming line of passenger car, commercial car, industrial, marine and aircraft motors.

## McGearty Truck Representative

J. P. McGearty has been appointed truck representative for the Cincinnati region of Dodge Brothers Corp.

## S.A.E. Query on Truck Ratings

The Society of Automotive Engineers has queried truck manufacturers and operators to ascertain if they have used the truck rating formula recently adopted for trial by the S.A.E. Truck Rating Committee. Discrepancies or weak spots in the method of rating are solicited.

## DeLisser Joins Smith & Gregory

Horace E. DeLisser has joined Smith & Gregory, New York City, in charge of the dealer sales division.

## AUTOMOTIVE REFERENCE MANUAL

"The Certified Data Source"

TRAILER FACTS  
AT YOUR FINGER TIPS!

Just off the press—the only compilation of its kind—authentic specifications, sizes, weights, prices, serial numbers, lengths, etc., and similar vital information applicable to all makes and models of automotive trailers from 1931 to date.

For the fullest development of your business today you must have all the facts, so act quickly, request NOW that we save you a copy of this valuable work (\$1.00).

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**NOC-OUT** *The HOSE CLAMP*  
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THE STANDARD EQUIPMENT HOSE CLAMP AT DEALERS

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CHICAGO, ILLINOIS

**LUCE**

**MASTERCRAFT**

TRUCK BODIES

Production and Custom Built Body Equipment Vocationally Designed

**LUCE MANUFACTURING CO.**  
Lansing, Michigan

## Air Cleaners

(CONTINUED FROM PAGE 25)

filter toward the outlet at the top.

A bead on the oil chamber indicates the proper level. The unit is serviced by removing, cleaning and refilling oil chamber regularly.

Air enters the Vortex cleaner, Fig. 7,

through a horizontal inlet which is tangent to the circular body. The air whirls around in the chamber and deposits dust particles against the oil soaked walls of the chamber. Air motion also picks up particles of oil and the air passes upward through a baffle into the filter element, which is made of crimped wire. Dust deposited on oil on the wire works toward the walls of the body then downward through a baffle and through a hole into the air stream entering the cleaner.

Oil level is shown by a bead on the cup and the cup should be cleaned, re-filled whenever the cup becomes more than one-fourth filled with dirt.

## Engine Life

(CONTINUED FROM PAGE 32)

with a flash point of more than 270 deg. would be all right to use in the engine.

Fleet owners should remember that the SAE viscosity numbers used to designate oil have a considerable spread and that it is possible to get an SAE 30 oil from one company which might be heavier than an SAE 30 oil from some other company. Differences resulting from using these two oils being due to the difference in viscosity, the operator might draw the wrong conclusion that one oil was superior to another, whereas if the two had been of the same viscosity—seconds at 210 degrees—the results in use would have been the same. For his own protection the operator should ask the exact seconds viscosity at 210 degrees and compare oils on that basis.

## GMT Modifications

Two modifications of existing models in the medium-duty class are announced by General Motors Truck Co. Model T-33L, based on the Model T-33, has a straight rating of 12,500 lb. It

## MARMON-HERRINGTON




World's Most Advanced  
All-Wheel-Drive Trucks

**\$2250** and Upward, f.o.b. Factory;  
21 Models, 1½ Tons and Upward

Write for Facts

**Marmon-Herrington Co., Inc.**  
Indianapolis, Indiana

## FOR REAL ECONOMY

**Exide** 

BATTERIES

FOR EVERY TYPE TRUCK

THE ELECTRIC STORAGE BATTERY CO.  
Philadelphia

The World's Largest Manufacturers of Storage  
Batteries for Every Purpose  
Exide Batteries of Canada, Limited, Toronto

## ● BERGERON

Patented Piston Rings  
Are Built for Trucks

—and that is the most important thing we can say to truck dealers, servicemen and fleet owners. Here is a heavy-duty ring, with perfect concentricity, no gap, rugged strength and durability beyond expectation. An ECONOMY RING from every standpoint—and how it stands up in service! Write for complete details.

**STERLING MOTOR PRODUCTS, INC.**  
560 DWIGHT ST., HOLYOKE, MASS.

carries a smaller, 221 cu. in. engine than the T-33. Four wheelbases are available.

The other option, Model T-43T, based on the model T-43, has a straight rating of 16,000 lb. with combined tractor and semi-trailer rating of 29,200 lb. gross. It is powered with a larger, 331 cu. in. engine than the T-43.

**WANT MORE FOR YOUR MONEY!**

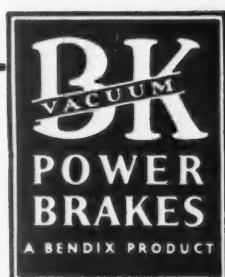
USE your trucks to pull the load—on Semi-Trailers. It means three times more payload—30% to 50% lower haulage costs. Send for "Engineered Transportation" booklet.

FRUEHAUF TRAILER CO., 10957 HARPER AVE., DETROIT, MICH.

**FRUEHAUF TRAILERS**  
"Engineered Transportation"



# What are you doing about Trailer Brakes?



**L**EGISLATURES, highway and police authorities have already sounded the death-knell

of brakeless trailers. In many sections they'll be outlawed on January 1, 1934.

Are *you* set to make these change-overs promptly? Economically? Efficiently?

Here's the common-sense course thousands of truck and trailer owners are following: They're installing time-

proved Bendix B-K Vacuum Power Brakes.

They are turning to Bendix

B-K quite naturally, because these pioneer Power Brakes have for more than eight years been proving their fitness. Bendix B-K Power Brakes will be found on more power brake-equipped vehicles than all other power types combined! Here are the main reasons:

- 100% POWER OPERATION, FULLY CONTROLLED
- LEAST ADDED WEIGHT
- FEWEST ADDED PARTS
- LOWEST FIRST COST
- PRACTICALLY NO MAINTENANCE
- INSTANT REMOTE CONTROL
- ALL EMERGENCY FEATURES OF TRAIN OPERATION
- QUICKLY INSTALLED
- ORIGINAL BRAKE SYSTEM LEFT INTACT

— [ *Write for the facts, on your business letterhead* ] —

**BENDIX PRODUCTS CORPORATION**

401 Bendix Drive, South Bend, Indiana

(Subsidiary of Bendix Aviation Corporation)

# COMMERCIAL CAR JOURNAL'S

CORRECTIONS ARE MADE EACH MONTH FROM DATA SUPPLIED DIRECT BY TRUCK MAKERS

| Line Number | MAKE AND MODEL   | GENERAL (See Keynote) |               |                    |                      | TIRE SIZE            |                        | MAJOR UNITS |            |                 |                                  |                | FRAME                       |                          |                                   |                                   |                  |             |
|-------------|------------------|-----------------------|---------------|--------------------|----------------------|----------------------|------------------------|-------------|------------|-----------------|----------------------------------|----------------|-----------------------------|--------------------------|-----------------------------------|-----------------------------------|------------------|-------------|
|             |                  | Tonnage Rating        | Chassis Price | Standard Wheelbase | Max. W. B. Furnished | Gross Vehicle Weight | Chassis Wt. (Stripped) | Front       | Rear       | ENGINE          |                                  | TRANSMISSION   |                             | REAR AXLE                |                                   |                                   |                  |             |
|             |                  |                       |               |                    |                      |                      |                        |             |            | Make and Model  | No. of Cylinders Bore and Stroke | Make and Model | Location and Forward Speeds | Aux. Location and Speeds | Make and Model                    | Gear and Type                     | Drive and Torque | GEAR RATIOS |
|             |                  |                       |               |                    |                      |                      |                        |             |            |                 |                                  |                |                             |                          |                                   |                                   |                  |             |
| 1           | A.C.F.           | 1606                  | 6950          | 186                | 222                  | 26000                | 10170                  | B9.75/22    | B9.75/22   | Has 160         | 6-4 1/2 x 5 1/2                  | BL 1714        | U4 Op                       | Tim 76730                | 2F                                | R 7.46 52.7 8x3                   | P                |             |
| 2           |                  | 175B                  | 8300          | 186                | 222                  | 26000                | 10750                  | B10.50/22   | B10.50/22  | Has 175         | 6-5 1/2 x 5 1/2                  | BL 714         | U4 Op                       | Tim 76730                | 2F                                | R 7.46 52.7 8x3                   | P                |             |
| 3           |                  | 175A                  | 8800          | 186                | 240                  | 30000                | 11610                  | B10.50/24   | B10.50/24  | Has 175         | 6-5 1/2 x 5 1/2                  | BL 714         | U4 Op                       | Tim 76730                | 2F                                | R 7.46 52.7 8x3                   | P                |             |
| 4           | Armleder         | 11HA                  | 1570          | 156                | 195                  | 11500                | 4070                   | B7.00/20    | DB7.00/20  | Con 16C         | 6-3 1/2 x 4 1/2                  | Fu WOB         | U4 No                       | Tim                      | BF                                | H 5.83 31.2 6x3 1/2               | P                |             |
| 5           |                  | 21HA                  | 2185          | 160                | 207                  | 15300                | 4783                   | B8.25/20    | DB8.25/20  | Her WXB         | 6-3 1/2 x 4 1/2                  | Fu MLU         | U4 No                       | Tim                      | BF                                | H 6.06 38.5 6x3 1/2               | P                |             |
| 6           |                  | 31HA                  | 2745          | 146                | 213                  | 19500                | 5838                   | B9.00/20    | DB9.00/20  | Her WXC         | 6-4 x 4 1/2                      | Fu MGU         | U4 No                       | Tim                      | BF                                | R 6.02 39.2 7x3 1/2               | P                |             |
| 7           |                  | 41HA                  | 3050          | 160                | 227                  | 23000                | 6600                   | B9.75/20    | DB9.75/20  | Her WXC         | 6-4 x 4 1/2                      | Fu MGU         | U4 No                       | Tim                      | BF                                | R 6.83 43.8 7x3 1/2               | P                |             |
| 8           |                  | 61HA                  | 3625          | 146                | 227                  | 24000                | 7400                   | B9.75/20    | DB9.75/20  | Her WXC2        | 6-4 1/2 x 4 1/2                  | Fu MGU         | U4 No                       | Tim                      | WF                                | R 8.5 55.2 8 1/2 x 3 1/2          | P                |             |
| 9           |                  | 71HA                  | 4595          | 164                | 235                  | 29500                | 7800                   | B10.50/20   | DB10.50/20 | Her YXC         | 6-4 1/2 x 4 1/2                  | Fu VUOG        | U5 No                       | Tim                      | WF                                | R 8.5 55.2 8 1/2 x 3 1/2          | P                |             |
| 10          |                  | TRDA                  | 3895          | 148                | 174                  | 39000                | 6450                   | B9.75/20    | DB9.75/20  | Her YXC3        | 6-4 1/2 x 4 1/2                  | Fu VUOG        | U5 No                       | Wis                      | 2F                                | R 7.8 56.8 7x3 1/2                | P                |             |
| 11          | Autocar          | RG                    | 3000          | 150                | 192                  | 11400                | 5975                   | P34x7       | DP34x7     | Ow R            | 6-3 1/2 x 4 1/2                  | Ow N           | U4 No                       | Ow N                     | 2F                                | H 6.21 39.3 8x3 1/2               | T                |             |
| 12          |                  | D3                    | 3500          | 150                | 192                  | 11400                | 6100                   | P34x7       | DP34x7     | Ow SD           | 6-4 x 4 1/2                      | Ow N           | U4 No                       | Ow N                     | 2F                                | H 6.21 39.3 8x3 1/2               | T                |             |
| 13          |                  | DF                    | 3950          | 150                | 192                  | 11400                | 6865                   | B9.00/20    | DB9.00/20  | Ow SD           | 6-4 x 4 1/2                      | Ow N           | U4 No                       | Ow TE                    | 2F                                | H 6.43 40.7 8x3 1/2               | T                |             |
| 14          |                  | DH                    | 4150          | 150                | 174                  | 11400                | 7250                   | P36x8       | DP36x8     | Ow SD           | 6-4 x 4 1/2                      | Ow N           | U4 No                       | Ow N                     | 2F                                | H 7.57 54.3 8x3 1/2               | T                |             |
| 15          |                  | N4                    | 4650          | 191                | 227                  | 16300                | 8090                   | B9.75/20    | DB9.75/20  | Ow SCH          | 6-4 1/2 x 4 1/2                  | Ow N           | U5 No                       | Ow N                     | 2F                                | H 7.20 45.6 9x3 1/2               | T                |             |
| 16          |                  | N5                    | 4750          | 191                | 227                  | 16300                | 8350                   | B9.75/22    | DB9.75/22  | Ow SCH          | 6-4 1/2 x 4 1/2                  | Ow N           | U5 No                       | Ow TF                    | 2F                                | H 7.20 45.6 9x3 1/2               | T                |             |
| 17          |                  | N6                    | 5500          | 158                | 168                  | 15000                | 8800                   | B9.75/22    | DB9.75/22  | Ow SCH          | 6-4 1/2 x 4 1/2                  | Ow N           | U5 No                       | Ow CG                    | 2F                                | H 8.52 54.0 9x3 1/2               | T                |             |
| 18          |                  | N7                    | 6650          | 158                | 176                  | 15000                | 10950                  | B10.50/24   | DB10.50/24 | Ow SCM          | 6-4 1/2 x 4 1/2                  | BL 734         | U4 A3                       | Wls 78720                | 2F                                | H 9.92 121.1 10 1/2 x 3 1/2       | T                |             |
| 19          |                  | N8                    | 6000          | 172                | 203                  | 19500                | 10300                  | S36x7       | DS40x8     | Ow SCM          | 6-4 1/2 x 4 1/2                  | Ow N           | U4 No                       | Ow N                     | 2F                                | R 8.57 52.6 9x3 1/2               | T                |             |
| 20          |                  | N9                    | 6200          | 203                | 203                  | 19500                | 9800                   | P42x9       | DP42x9     | Ow SCM          | 6-4 1/2 x 4 1/2                  | Ow N           | U4 No                       | Ow N                     | 2F                                | H 8.57 52.6 9x3 1/2               | T                |             |
| 21          |                  | N10                   | 5900          | 192                | 242                  | 19500                | 9975                   | B10.50/22   | DB10.50/22 | Ow SCM          | 6-4 1/2 x 4 1/2                  | Ow N           | U5 No                       | Ow N                     | 2F                                | H 7.20 88.5 9x3 1/2               | T                |             |
| 22          |                  | N11                   | 6300          | 189                | 207                  | 19500                | 10700                  | B9.75/22    | DB9.75/22  | Ow SCM          | 6-4 1/2 x 4 1/2                  | BL 734         | U5 No                       | Ow TG                    | 2F                                | H 7.20 88.5 9x3 1/2               | T                |             |
| 23          | (Eng. und. seat) | N12                   | 3500          | 89                 | 145                  | 11400                | 6170                   | P34x7       | DP34x7     | Ow SD           | 6-4 x 4 1/2                      | Ow N           | U4 No                       | Ow N                     | 2F                                | H 7.20 88.5 9x3 1/2               | T                |             |
| 24          |                  | UD3                   | 4650          | 96                 | 163                  | 11400                | 9040                   | B9.75/20    | DB9.75/20  | Ow SCH          | 6-4 1/2 x 4 1/2                  | Ow N           | U4 No                       | Ow C & N                 | 2F                                | H 7.20 45.6 9x3 1/2               | T                |             |
| 25          |                  | US                    | 5300          | 98                 | 163                  | 11400                | 9380                   | B9.75/22    | DB9.75/22  | Ow SCH          | 6-4 1/2 x 4 1/2                  | Ow N           | U4 No                       | Ow CG & TG               | 2F                                | H 7.20 45.6 9x3 1/2               | T                |             |
| 26          |                  | UT6                   | 5600          | 98                 | 163                  | 11400                | 9510                   | B10.50/22   | DB10.50/22 | Ow SCM          | 6-4 1/2 x 4 1/2                  | Ow N           | U4 No                       | Ow CG & TG               | 2F                                | H 7.20 45.6 9x3 1/2               | T                |             |
| 27          |                  | UTE                   | 6300          | 98                 | 150                  | 11400                | 10050                  | B9.75/22    | DB9.75/22  | Ow SCM          | 6-4 1/2 x 4 1/2                  | Ow N           | U4 No                       | Ow CG & TG               | 2F                                | H 7.20 45.6 9x3 1/2               | T                |             |
| 28          | Available        | W20                   | 1350          | Op                 | Op                   | 11400                | 4000                   | B7.00/20    | DB7.00/20  | Wau ZK          | 6-3 1/2 x 4 1/2                  | WG T9          | U4 No                       | Tim 53200                | SF                                | R 6.6 42.2 10x2 1/2 x 1 1/2       | TX               |             |
| 29          |                  | W20C                  | 1850          | Op                 | Op                   | 13400                | 4500                   | B7.50/20    | DB7.50/20  | Wau TL          | 6-3 1/2 x 4 1/2                  | BL 224         | U4 No                       | Tim 54300                | SF                                | R 6.8 43.5 10x2 1/2 x 1 1/2       | TX               |             |
| 30          |                  | W230                  | 2250          | Op                 | Op                   | 16300                | 5500                   | B8.25/20    | DB8.25/20  | Wau 6-90        | 6-3 1/2 x 4 1/2                  | BL 234         | U4 No                       | Tim 56200                | SF                                | R 7.4 47.4 12x2 1/2 x 1 1/2       | TX               |             |
| 31          |                  | W300                  | 2750          | Op                 | Op                   | 20700                | 7000                   | B9.00/20    | DB9.00/20  | Wau 6-110       | 6-3 1/2 x 4 1/2                  | BL 334         | U4 No                       | Tim 58205                | SF                                | R 7.8 54.6 12x2 1/2 x 1 1/2       | TX               |             |
| 32          |                  | W400                  | 3750          | Op                 | Op                   | 25500                | 8200                   | B9.75/20    | DB9.75/20  | Wau 6-125       | 6-4 1/2 x 5 1/2                  | BL 615         | U5 No                       | Tim 65720H               | WF                                | R 8.5 55.6 12x2 1/2 x 1 1/2       | TX               |             |
| 33          | Brockway         | 80C                   | 1185          | 149                | 168                  | 10500                | 4035                   | B6.50/20    | DB6.50/20  | Con 26B         | 6-3 1/2 x 4                      | Wa T9          | U4 No                       | Tim 53200H               | SF                                | H 5.66 36.2 5 1/2 x 3 1/2 x 1 1/2 | C                |             |
| 34          |                  | 90C                   | 1485          | 149                | 168                  | 12500                | 4480                   | B7.00/20    | DB7.00/20  | Con 28B         | 6-3 1/2 x 4 1/2                  | Wa T9          | U4 No                       | Tim 54300H               | SF                                | H 5.83 37.4 7 1/2 x 2 1/2 x 1 1/2 | C                |             |
| 35          |                  | 120C                  | 1800          | 168                | 188                  | 15000                | 4985                   | B7.50/20    | DB7.50/20  | Con 28B         | 6-3 1/2 x 4 1/2                  | BL 314         | U5 No                       | Tim 54300H               | SF                                | H 5.83 46.0 7 1/2 x 2 1/2 x 1 1/2 | C                |             |
| 36          |                  | 130C                  | 2090          | 156                | 188                  | 15000                | 5640                   | B7.50/20    | DB7.50/20  | Con 30B         | 6-4 x 4 1/2                      | BL 314         | U4 No                       | Tim 54300H               | SF                                | H 5.83 38.5 7 1/2 x 2 1/2 x 1 1/2 | T                |             |
| 37          |                  | 140C                  | 2680          | 156                | 200                  | 17500                | 6385                   | B8.25/20    | DB8.25/20  | Con 30B         | 6-4 x 4 1/2                      | BL 314         | U4 No                       | Tim 54300H               | SF                                | H 5.83 38.5 7 1/2 x 2 1/2 x 1 1/2 | T                |             |
| 38          |                  | 150C                  | 2540          | 188                | 200                  | 18500                | 6000                   | B9.00/20    | DB9.00/20  | Con E600        | 6-3 1/2 x 4 1/2                  | BL 334         | U4 Op                       | Tim 5621 H               | SF                                | R 5.71 35.0 8x3 1/2               | T                |             |
| 39          |                  | 141C                  | 3175          | 170                | 212                  | 19500                | 7450                   | B9.00/20    | DB9.00/20  | Con 30B         | 6-4 x 4 1/2                      | BL 314         | U4 Op                       | Wls 70000L               | 2F                                | R 7.0 46.2 8x3 1/2                | T                |             |
| 40          |                  | 160C                  | 3175          | 188                | 200                  | 21000                | 7500                   | B9.00/20    | DB9.00/20  | Con 32B         | 6-4 1/2 x 4 1/2                  | BL 534         | U5 Op                       | Tim 58200H               | SF                                | R 6.14 48.5 8x3 1/2               | T                |             |
| 41          |                  | 170C                  | 3450          | 170                | 212                  | 19500                | 7700                   | B9.00/20    | DB9.00/20  | Con 33B         | 6-4 1/2 x 4 1/2                  | BL 534         | U4 Op                       | Wls 70000L               | 2F                                | R 6.28 39.9 8x3 1/2               | T                |             |
| 42          |                  | 175C                  | 3850          | 170                | 224                  | 24000                | 7900                   | B9.00/20    | DB9.00/20  | Con 34B         | 6-4 1/2 x 4 1/2                  | BL 525         | U5 Op                       | Tim 70000L               | 2F                                | R 6.28 39.9 8x3 1/2               | T                |             |
| 43          |                  | 195C                  | 4000          | 170                | 224                  | 24000                | 8540                   | B9.75/20    | DB9.75/20  | Con 32B         | 6-4 1/2 x 4 1/2                  | BL 534         | U5 Op                       | Tim 70000L               | 2F                                | R 6.28 39.9 8x3 1/2               | T                |             |
| 44          |                  | 220C                  | 4700          | 170                | 224                  | 28000                | 8980                   | B10.50/20   | DB10.50/20 | Con 34B         | 6-4 1/2 x 4 1/2                  | BL 534         | U5 Op                       | Tim 70000L               | 2F                                | R 6.28 39.9 8x3 1/2               | T                |             |
| 45          |                  | 260C                  | 5850          | 212                | 240                  | 34000                | 10075                  | B10.50/24   | DB10.50/24 | Con 35B         | 6-4 1/2 x 5 1/2                  | Fu MHU         | U4 Op                       | Wls 1737KH               | 2F                                | R 8.05 50.7 8 1/2 x 3 1/2         | B                |             |
| 46          |                  | 260S                  | 6200          | 212                | 240                  | 34000                | 10075                  | B10.50/24   | DB10.50/24 | Con 35B         | 6-4 1/2 x 5 1/2                  | Fu MHU         | U4 Op                       | Wls 1737KH               | 2F                                | R 8.05 50.7 8 1/2 x 3 1/2         | B                |             |
| 47          | Chevrolet Comm'l | 330                   | 109           | 109                | 4100                 | 1995                 | B5.25/18               | B5.25/18    | Ow N       | 6-3 1/2 x 4     | Ow N                             | U3 No          | Ow N                        | S14                      | U 4.11 39.7 5x2 1/2 x 1 1/2       | C                                 |                  |             |
| 48          | Utility          | 480                   | 131           | 131                | 8300                 | 2830                 | P30x5                  | P32x6       | Ow N       | 6-3 1/2 x 4     | Ow N                             | U4 No          | Ow N                        | S14                      | U 5.43 39.2 6 1/2 x 2 1/2 x 1 1/2 | C                                 |                  |             |
| 49          | Utility          | 510                   | 157           | 157                | 8300                 | 2920                 | P30x5                  | P32x6       | Ow N       | 6-3 1/2 x 4     | Ow N                             | U4 No          | Ow N                        | S14                      | U 5.43 39.2 6 1/2 x 2 1/2 x 1 1/2 | C                                 |                  |             |
| 50          | Coleman          | 3800                  | 120           | 144                | 12800                | 7200                 | B9.00/24               | B9.00/24    | Bud K393   | 6-4 1/2 x 4 1/2 | Fu RU 16                         | U4 A2          | Wls CR15                    | 2F                       | H Opt Opt 10x2 1/2 x 1 1/2        | B                                 |                  |             |
| 51          | (all 4 Wh. Dr.)  | E53                   | 5300          | 130                | 180                  | 18900                | 8000                   | B9.75/24    | B9.75/24   | Bud L425        | 6-4 1/2 x 4 1/2                  | Fu MRU16       | U4 A2                       | Wls CR26                 | 2F                                | H Opt Opt 12x2 1/2 x 1 1/2        | B                |             |
| 52          |                  | E54                   | 5600          | 130                | 180                  | 20400                | 8800                   | B10.50/24   | B10.50/24  | Bud L465        | 6-4 1/2 x 4 1/2                  | Fu MRU16       | U4 A2                       | Wls CR26                 | 2F                                | H Opt Opt 12x2 1/2 x 1 1/2        | B                |             |
| 53          |                  | E55                   | 6150          | 130                | 180                  | 23000                | 9600                   | B11.25/24   | B11.25/24  | Bud L525        | 6-4 1/2 x 4 1/2                  | Fu MRU16       | U4 A2                       | Wls CR30                 | 2F                                | H Opt Opt 12x2 1/2 x 1 1/2        | B                |             |
| 54          |                  | E55S                  | 7200          | 144                | 180                  | 24500                | 10600                  | B11.25/24   | B11.25/24  | Bud L525        | 6-4 1/2 x 4 1/2                  | Fu MRU16       | U4 A2                       | Wls CR122                | 2F                                | H Opt Opt 12x2 1/2 x 1 1/2        | B                |             |
| 55          |                  | E56                   | 7800          | 144                | 180                  |                      |                        |             |            |                 |                                  |                |                             |                          |                                   |                                   |                  |             |



# TRUCK SPECIFICATIONS TABLE

FOR MEANING OF ABBREVIATIONS AND EXPLANATION OF REFERENCE MARKS SEE PAGE 50

| FRAME | ENGINE DETAILS |                     |                   |                |                     |                                 |                   |                |                 |                     | FUEL SYST. | ELEC-TRICAL | FRONT AXLE | BRAKES        |                  | BODY MOUNT-ING DATA |                      | SPRINGS                 |                      | Aux.   |               |                |                |                    |         |             |                     |                      |                  |                |       |      |
|-------|----------------|---------------------|-------------------|----------------|---------------------|---------------------------------|-------------------|----------------|-----------------|---------------------|------------|-------------|------------|---------------|------------------|---------------------|----------------------|-------------------------|----------------------|--------|---------------|----------------|----------------|--------------------|---------|-------------|---------------------|----------------------|------------------|----------------|-------|------|
|       | Line Number    | Piston Displacement | Compression Ratio | Torque lb. ft. | N.A.C.C. Rated H.P. | Max. Brake H.P. at R.P.M. Given | Valve Arrangement | Camshaft Drive | MAIN BEARINGS   |                     |            |             |            | Governor Make | Carburetors Make | Fuel Feed           | Ignition System Make | Generator, Starter Make | Clutch Type and Make |        | Radiator Make | Universal Make | Make and Model | Steering Gear Make | SERVICE |             | Hand Location, Type | Cab to Rear of Frame | Cab to Rear Axle | Width of Frame | Front | Rear |
|       |                |                     |                   |                |                     |                                 |                   |                | Piston Material | Number and Diameter |            |             |            |               |                  |                     |                      |                         |                      |        |               |                |                |                    | Length  | Lining Area |                     |                      |                  |                |       |      |
| 1468  | 4.4            | 322                 | 43.3              | 120-2200       | H                   | C                               | A                 | 7-3 1/2        | 10%             | CC                  | Ha         | Zen         | V          | DR            | DR               | P.B.L               | Lo                   | Spi                     | Tim                  | 27451  | Ros           | O4IA           | 720            | A                  | CD      | 172         | 102                 | 33 1/2               | 42x3             | 56x4           | N     |      |
| 2707  | 4.4            | 500                 | 60.               | 175-2200       | H                   | C                               | A                 | 7-3 1/2        | 14%             | CC                  | Ha         | Zen         | M          | DR            | DR               | P.B.B               | Lo                   | Spi                     | Tim                  | 27451  | Ros           | O4IA           | 720            | A                  | CD      | 172         | 102                 | 33 1/2               | 42x3             | 56x4           | N     |      |
| 3707  | 4.4            | 500                 | 60.               | 175-2200       | H                   | C                               | A                 | 7-3 1/2        | 14%             | CC                  | Ha         | Zen         | M          | DR            | DR               | P.B.B               | Lo                   | Spi                     | Tim                  | 27451  | Ros           | O4IA           | 720            | A                  | CD      | 172         | 102                 | 33 1/2               | 42x3             | 56x4           | N     |      |
| 4248  | 5.0            | 150                 | 27.3              | 65-2600        | L                   | G                               | C                 | 7-2 1/2        | 10%             | PC                  | No         | Zen         | M          | DR            | DR               | P.B.B               | Yo                   | Spi                     | Tim                  | 27451  | Ros           | L4IH           | 380            | G                  | TX      | 129 1/2     | Opt                 | 31 1/2               | 40x2 1/2         | 50x3           | N     |      |
| 5298  | 4.7            | 192                 | 33.7              | 66-2200        | L                   | G                               | C                 | 7-2 1/2        | 13%             | PC                  | Mo         | Zen         | M          | AL            | AL               | D.Fu                | Yo                   | Spi                     | Tim                  | 27451  | Ros           | L4IHV          | 452            | G                  | TX      | 129 1/2     | Opt                 | 31 1/2               | 40x2 1/2         | 50x3           | N     |      |
| 6339  | 4.7            | 225                 | 38.4              | 73-2200        | L                   | G                               | C                 | 7-2 1/2        | 13%             | PC                  | Mo         | Zen         | M          | AL            | AL               | D.Fu                | Yo                   | Spi                     | Tim                  | 27451  | Ros           | L4IHV          | 578            | G                  | TX      | 106         | Opt                 | 31 1/2               | 40x2 1/2         | 62 1/2 x 2 1/2 | N     |      |
| 7339  | 4.7            | 225                 | 38.4              | 73-2200        | L                   | G                               | C                 | 7-2 1/2        | 13%             | PC                  | Mo         | Zen         | M          | AL            | AL               | D.Fu                | Yo                   | Spi                     | Tim                  | 27451  | Ros           | L4IHV          | 658            | G                  | TX      | 118         | Opt                 | 31 1/2               | 40x2 1/2         | 62 1/2 x 2 1/2 | N     |      |
| 8300  | 4.7            | 238                 | 40.3              | 80-2200        | L                   | G                               | C                 | 7-3            | 13%             | PC                  | Mo         | Zen         | M          | AL            | AL               | D.Fu                | Yo                   | Spi                     | Shu                  | 27451  | Ros           | L4IHV          | 768            | G                  | TX      | 106         | Opt                 | 31 1/2               | 41x2 1/2         | 62 1/2 x 2 1/2 | N     |      |
| 9428  | 4.7            | 280                 | 46.3              | 93-2200        | L                   | G                               | C                 | 7-3            | 15%             | PC                  | Mo         | Zen         | M          | AL            | AL               | D.Fu                | Yo                   | Spi                     | Shu                  | 27451  | Ros           | L4IHV          | 893            | G                  | TX      | 118         | Opt                 | 31 1/2               | 41x2 1/2         | 62 1/2 x 2 1/2 | N     |      |
| 10474 | 4.4            | 318                 | 51.2              | 103-2200       | L                   | G                               | C                 | 7-3            | 15%             | PC                  | Mo         | Zen         | M          | AL            | AL               | D.Fu                | Yo                   | Spi                     | Shu                  | 27451  | Ros           | L4IHV          | 893            | G                  | TX      | 118         | Opt                 | 31 1/2               | 41x2 1/2         | 62 1/2 x 2 1/2 | N     |      |
| 11314 | 5.2            | 213                 | 33.7              | 75-2400        | L                   | G                               | C                 | 7-3            | 12%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 31000  | Ros           | L4IMV          | 450            | e                  | 2I      | 124 1/2     | 72 1/2              | 34 1/2               | 40x2 1/2         | 54x3           | N     |      |
| 12358 | 5.2            | 240                 | 38.4              | 84-2500        | L                   | G                               | C                 | 7-3            | 12%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 31000  | Ros           | L4IMV          | 450            | e                  | 2I      | 115 1/2     | 63 1/2              | 34 1/2               | 40x2 1/2         | 54x3           | N     |      |
| 13358 | 5.2            | 240                 | 38.4              | 84-2500        | L                   | G                               | C                 | 7-3            | 12%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 31000  | Ros           | L4IMV          | 519            | e                  | 2I      | 115 1/2     | 63 1/2              | 34 1/2               | 42 1/2 x 3       | 54x3           | N     |      |
| 14358 | 5.2            | 240                 | 38.4              | 84-2500        | L                   | G                               | C                 | 7-3            | 12%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 31000  | Ros           | L4IMV          | 519            | e                  | 2I      | 115 1/2     | 63 1/2              | 34 1/2               | 42 1/2 x 3       | 54x3           | N     |      |
| 15404 | 5.2            | 271                 | 43.4              | 94-2500        | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 31000  | Ros           | L4IMV          | 519            | e                  | 2I      | 115 1/2     | 63 1/2              | 34 1/2               | 42 1/2 x 3       | 54x3           | N     |      |
| 16404 | 5.2            | 271                 | 43.4              | 94-2500        | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 31000  | Ros           | L4IMV          | 519            | e                  | 2I      | 115 1/2     | 63 1/2              | 34 1/2               | 42 1/2 x 3       | 54x3           | N     |      |
| 17404 | 5.2            | 271                 | 43.4              | 94-2500        | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 31000  | Ros           | L4IMV          | 519            | e                  | 2I      | 115 1/2     | 63 1/2              | 34 1/2               | 42 1/2 x 3       | 54x3           | N     |      |
| 18453 | 5.1            | 309                 | 48.6              | 101-2400       | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 27450  | Ros           | L4IMV          | 664            | e                  | 2I      | 121 1/2     | 73 1/2              | 34 1/2               | 42 1/2 x 3       | 54 1/2 x 4     | N     |      |
| 19453 | 5.1            | 309                 | 48.6              | 101-2400       | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 27450  | Ros           | O2IMV          | 502            | e                  | FD      | 88 1/2      | 158 1/2             | 34 1/2               | 42 1/2 x 3       | 55x4           | N     |      |
| 20453 | 5.1            | 309                 | 48.6              | 101-2400       | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 26450  | Ros           | BO4IMV         | 670            | e                  | FD      | 119 1/2     | 210                 | 34 1/2               | 42 1/2 x 3       | 54 1/2 x 4     | N     |      |
| 21453 | 5.1            | 309                 | 48.6              | 101-2400       | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 26450  | Ros           | O4IA           | 544            | e                  | FD      | 175 1/2     | 105                 | 34 1/2               | 42 1/2 x 3       | 54 1/2 x 4     | N     |      |
| 22453 | 5.2            | 309                 | 48.6              | 101-2400       | L                   | G                               | C                 | 7-3            | 12%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 26450  | Ros           | O4IA           | 544            | e                  | FD      | 223         | 104 1/2             | 34 1/2               | 42 1/2 x 3       | 54 1/2 x 4     | N     |      |
| 23453 | 5.2            | 309                 | 48.6              | 101-2400       | L                   | G                               | C                 | 7-3            | 12%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 26450  | Ros           | L4IMV          | 450            | e                  | 2I      | 112         | 64 1/2              | 34 1/2               | 41x2 1/2         | 54x3           | N     |      |
| 24404 | 5.1            | 271                 | 43.4              | 94-2500        | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 26450  | Ros           | L4IMV          | 544            | e                  | FD      | 121 1/2     | 73 1/2              | 34 1/2               | 41x3             | 53 1/2 x 4     | N     |      |
| 25404 | 5.1            | 271                 | 43.4              | 94-2500        | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 26450  | Ros           | L4IMV          | 544            | e                  | FD      | 121 1/2     | 73 1/2              | 34 1/2               | 41x3             | 53 1/2 x 4     | N     |      |
| 26453 | 5.1            | 309                 | 48.6              | 101-2400       | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 27450  | Ros           | O4IA           | 660            | e                  | FD      | 104         | 73 1/2              | 34 1/2               | 41x3             | 53 1/2 x 4     | N     |      |
| 27453 | 5.1            | 309                 | 48.6              | 101-2400       | L                   | G                               | C                 | 7-3            | 14%             | FP                  | Ow         | Str         | M          | DR            | DR               | dp.Lo               | GO                   | Spi                     | Tim                  | 27450  | Ros           | O4IA           | 660            | e                  | FD      | 104         | 73 1/2              | 34 1/2               | 41x3             | 53 1/2 x 4     | N     |      |
| 28221 | 4.9            | 144                 | 27.3              | 63-3000        | L                   | G                               | C                 | 7-2 1/2        | 6%              | FP                  | No         | Sch         | M          | DR            | DR               | P.B.L               | Ch                   | Blo                     | Tim                  | 30000H | Ros           | L4IH           | 269            | a                  | TX      | Opt         | Opt                 | 32                   | 42 1/2 x 2 1/2   | 58x2 1/2       | N     |      |
| 29255 | 5.1            | 175                 | 37.3              | 89-2600        | L                   | G                               | C                 | 7-2 1/2        | 10%             | CC                  | Wa         | Ma          | M          | DR            | DR               | P.B.B               | Ch                   | Blo                     | Tim                  | 31000H | Ros           | L4IH           | 330            | a                  | TX      | Opt         | Opt                 | 32                   | 42 1/2 x 2 1/2   | 58x2 1/2       | N     |      |
| 30255 | 5.1            | 182                 | 37.3              | 90-3200        | F                   | G                               | A                 | 7-2 1/2        | 12%             | CC                  | Wa         | Ma          | M          | DR            | DR               | P.B.B               | Ch                   | Blo                     | Tim                  | 31000H | Ros           | L4IH           | 330            | a                  | TX      | Opt         | Opt                 | 32                   | 42 1/2 x 2 1/2   | 58x2 1/2       | N     |      |
| 31358 | 5.1            | 254                 | 38.4              | 110-2500       | F                   | G                               | A                 | 7-2 1/2        | 12%             | CC                  | Wa         | Ma          | M          | DR            | DR               | P.B.B               | Ch                   | Blo                     | Tim                  | 31000H | Ros           | L4IH           | 330            | a                  | TX      | Opt         | Opt                 | 32                   | 42 1/2 x 2 1/2   | 58x2 1/2       | N     |      |
| 32462 | 5.0            | 324                 | 45.9              | 125-2600       | F                   | G                               | A                 | 7-3            | 13%             | CC                  | Wa         | Ma          | M          | DR            | DR               | P.B.L               | Ch                   | Blo                     | Tim                  | 35000H | Ros           | L4IHV          | 462            | E                  | FD      | Opt         | Opt                 | 32                   | 42 1/2 x 2 1/2   | 58x3           | N     |      |
| 33214 | 4.9            | 142                 | 27.3              | 72-3200        | L                   | G                               | C                 | 7-2 1/2        | 6%              | CC                  | No         | Zen         | M          | AL            | AL               | P.B.B               | GO                   | Spi                     | Col                  | 4006   | Ros           | B4IM           | 248            | G                  | TX      | 111         | 65                  | 34                   | 37x2 1/2         | 52x2 1/2       | N     |      |
| 34248 | 4.9            | 170                 | 27.3              | 78-3100        | L                   | G                               | C                 | 7-2 1/2        | 10%             | CC                  | No         | Zen         | M          | AL            | AL               | P.B.B               | GO                   | Spi                     | Col                  | 5500A8 | Ros           | L4IH           | 353            | G                  | CD      | 111         | 65                  | 34                   | 37x2 1/2         | 52x2 1/2       | N     |      |
| 35248 | 4.9            | 170                 | 27.3              | 78-3100        | L                   | G                               | C                 | 7-2 1/2        | 10%             | CC                  | No         | Zen         | M          | AL            | AL               | P.B.B               | GO                   | Spi                     | Col                  | 5500A9 | Ros           | L4IH           | 353            | G                  | CD      | 141         | 84                  | 34                   | 37x2 1/2         | 52x2 1/2       | N     |      |
| 36314 | 4.9            | 196                 | 30.8              | 89-2600        | H                   | C                               | N                 | 7-2 1/2        | 13%             | CC                  | No         | Zen         | M          | AL            | AL               | P.B.B               | GO                   | Spi                     | Col                  | 5500A7 | Ros           | L4IH           | 353            | G                  | CD      | 108         | 69                  | 34                   | 40x2 1/2         | 54x3           | N     |      |
| 37311 | 4.2            | 196                 | 30.8              | 73-2400        | H                   | C                               | N                 | 7-2 1/2        | 13%             | CC                  | KP         | Zen         | M          | AL            | AL               | P.B.B               | GO                   | Spi                     | Shu                  | 15692B | Ros           | L4IHV          | 380            | G                  | CD      | 108         | 69                  | 34                   | 40x2 1/2         | 54x3           | N     |      |
| 38288 | 4.7            | 180                 | 32.6              | 73-2700        | L                   | G                               | N                 | 7-2 1/2        | 11%             | FP                  | KP         | Zen         | M          | AL            | AL               | P.B.B               | GO                   | Spi                     | Shu                  | 15692B | Ros           | L4IHV          | 380            | G                  | CD      | 108         | 69                  | 34                   | 40x2 1/2         | 54x3           | N     |      |
| 39311 | 4.2            | 196                 | 30.8              | 73-2400        | H                   | C                               | N                 | 7-2 1/2        | 13%             | CC                  | KP         | Zen         | M          | AL            | AL               | P.B.B               | GO                   | Spi                     | Shu                  | 15692B | Ros           | L4IHV          | 380            | G                  | CD      | 108         | 69                  | 34                   | 40x2 1/2         | 54x3           | N     |      |
| 40360 | 4.2            | 196                 | 30.8              | 73-2400        | H                   | C                               | N                 | 7-2 1/2        |                 |                     |            |             |            |               |                  |                     |                      |                         |                      |        |               |                |                |                    |         |             |                     |                      |                  |                |       |      |



| Line Number | MAKE AND MODEL | GENERAL (See Keynote) |               |                    |                      | TIRE SIZE            |                        | MAJOR UNITS. |      |                |                                  |              |                             |                          |                |               |                  | FRAME |             |                      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|             |                | Tonnage Rating        | Chassis Price | Standard Wheelbase | Max. W. B. Furnished | Gross Vehicle Weight | Chassis Wt. (Stripped) | Front        | Rear | Make and Model | No. of Cylinders Bore and Stroke | TRANSMISSION | REAR AXLE                   |                          |                |               |                  |       |             |                      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|             |                |                       |               |                    |                      |                      |                        |              |      |                |                                  |              | Location and Forward Speeds | Aux. Location and Speeds | Make and Model | Gear and Type | Drive and Torque |       | GEAR RATIOS | Side Rail Dimensions |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|             |                |                       |               |                    |                      |                      |                        |              |      |                |                                  |              |                             |                          |                |               |                  |       |             |                      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

FRAME

Side Rail Dimensions

Type

JOURNAL

## ENGINE DETAILS

## FUEL

## ELEC.

## FRONT

## BRAKES

## BODY MOUNTING DATA

## SPRINGS

| Line Number | Piston Displacement | Compression Ratio | Torque lb. ft. | N.A.C.C. Rated H.P. | Max. Brake H.P. at R.P.M. Given | Valve Arrangement | Camshaft Drive | Piston Material | MAIN BEARINGS       |        | Oiling System Type | Governor Make | Carburetors Make | Fuel Feed | Ignition System Make | Generator, Starter Make | Clutch Type and Make | Radiator Make | Universal Make | Make and Model | SERVICE                        |                                | Make, Location Type, Operation | Lining Area | Drum Material | Hand Location, Type | Cab to Rear of Frame | Cab to Rear Axle | Width of Frame | Front    | Rear | Auxiliary Type |
|-------------|---------------------|-------------------|----------------|---------------------|---------------------------------|-------------------|----------------|-----------------|---------------------|--------|--------------------|---------------|------------------|-----------|----------------------|-------------------------|----------------------|---------------|----------------|----------------|--------------------------------|--------------------------------|--------------------------------|-------------|---------------|---------------------|----------------------|------------------|----------------|----------|------|----------------|
|             |                     |                   |                |                     |                                 |                   |                |                 | Number and Diameter | Length |                    |               |                  |           |                      |                         |                      |               |                |                | SERVICE                        |                                |                                |             |               |                     |                      |                  |                |          |      |                |
|             |                     |                   |                |                     |                                 |                   |                |                 |                     |        |                    |               |                  |           |                      |                         |                      |               |                |                | Make, Location Type, Operation | Make, Location Type, Operation |                                |             |               |                     |                      |                  |                |          |      |                |
| 1201        | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 2337        | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 3196        | 4.0                 | 13.2              | 21.0           | 48                  | 2800                            | L                 | L              | L               | 4-2 1/2             | 4 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 4201        | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 6208        | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 7217        | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 8217        | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 9309        | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 10217       | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 11241       | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 12309       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 13384       | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 14222       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 15219       | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 16255       | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 17251       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 18384       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 19517       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 20200       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 21228       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 22263       | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 23282       | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 24251       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 25251       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 26315       | 5.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 27381       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 28381       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 29339       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 30339       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 31384       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 32384       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 33384       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 34381       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 35428       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 36428       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 37471       | 3.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 38428       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 39200       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 40200       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 41200       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 42251       | 4.0                 | 13.2              | 23.5           | 62                  | 3000                            | L                 | C              | S               | 4-2 1/2             | 6 1/2  | CC                 | No            | Car              | M         | DR                   | DR                      | P                    | BB            | Fe             | Ow             | Ow                             | O4IH                           | 175                            | a           | TX            | 91 1/4              | 50 1/2               | 34               | 36x1 1/4       | 48x2 1/4 | NN   |                |
| 4320        |                     |                   |                |                     |                                 |                   |                |                 |                     |        |                    |               |                  |           |                      |                         |                      |               |                |                |                                |                                |                                |             |               |                     |                      |                  |                |          |      |                |



| Line Number | MAKE AND MODEL       | Tonnage Rating | GENERAL (See Keynote) |                    |                      |                      |                        | TIRE SIZE |            | MAJOR UNITS |              |                |                             |                          |                |             |                      |       |               | FRAME            |         | Line Number | Piston Displacement |
|-------------|----------------------|----------------|-----------------------|--------------------|----------------------|----------------------|------------------------|-----------|------------|-------------|--------------|----------------|-----------------------------|--------------------------|----------------|-------------|----------------------|-------|---------------|------------------|---------|-------------|---------------------|
|             |                      |                | Chassis Price         | Standard Wheelbase | Max. W. B. Furnished | Gross Vehicle Weight | Chassis Wt. (Stripped) | Front     | Rear       | ENGINE      | TRANSMISSION | REAR AXLE      |                             |                          |                | GEAR RATIOS | Side Rail Dimensions | Type  |               |                  |         |             |                     |
|             |                      |                |                       |                    |                      |                      |                        |           |            |             |              | Make and Model | Location and Forward Speeds | Aux. Location and Speeds | Make and Model |             |                      |       | Gear and Type | Drive and Torque | In High |             |                     |
| 1           | Indiana 47DR         | 5-7            | 7000                  | 188                | 224                  | 28000                | 10500                  | B10.50/20 | DB10.50/20 | Cum6HDie    | 6-4x4x6      | BL 735         | A 5                         | No                       | Wis 1910W      | 2F          | R 7.16               | 45.0  | 8x4x3x3       | T                | 1762    | 1762        |                     |
| 2           | International (S) D1 | 1 1/2          | 360                   | 113                | 113                  | 4200                 | 2180                   | B5.25/18  | B5.25/18   | Own D       | 4-3x4x4      | Own D          | U 3                         | No                       | Own D-55       | 2F          | H 4.18               | 12.7  | 5x4x2x3       | T                | 2213    | 2213        |                     |
| 3           | M2                   | 1 1/2          | 850                   | 118                | 118                  | 7000                 | 3180                   | B6.50/20  | B6.50/20   | Wau XAH     | 4-3x4x4      | Own H-4-A      | U 4                         | No                       | Own 713        | 2F          | H 6.16               | 39.5  | 11x2x3x3      | T                | 3180    | 3180        |                     |
| 4           | A2                   | 1 1/2          | 615                   | 136                | 160                  | 8000                 | 2945                   | B6.00/20  | B6.00/20   | Wau XAH     | 4-3x4x4      | Own H-4-A      | U 4                         | No                       | Own 708        | 2F          | H 6.16               | 39.5  | 5x4x3x3       | T                | 5186    | 5186        |                     |
| 5           | B2                   | 1 1/2          | 615                   | 136                | 136                  | 8000                 | 2945                   | B6.00/20  | B6.00/20   | Wau XAH     | 4-3x4x4      | MM "O"         | U 3                         | No                       | Own 704        | 2F          | H 6.16               | 47.3  | 5x4x3x3       | T                | 6224    | 6224        |                     |
| 6           | A3                   | 1 1/2          | 695                   | 136                | 160                  | 10000                | 3572                   | P30x5     | P32x6      | Lyc SAH     | 6-3x4x4      | Own H-4-A      | U 4                         | No                       | Own 710        | 2F          | H 5.28               | 33.8  | 7x2x3x3       | T                | 7224    | 7224        |                     |
| 7           | A3                   | 1 1/2          | 970                   | 136                | 160                  | 10100                | 3600                   | B6.50/20  | DB6.50/20  | Lyc SAH     | 6-3x4x4      | WG T7          | U 4                         | Own                      | 710            | 2F          | H 5.28               | 33.8  | 7x2x3x3       | T                | 9207    | 9207        |                     |
| 8           | A3                   | 1 1/2          | 995                   | 138                | 164                  | 10000                | 4032                   | B6.00/20  | DB6.00/20  | Lyc 4SLH    | 6-3x4x4      | WG T7          | U 4                         | Own                      | 800            | 2F          | H 6.50               | 42.9  | 5x4x3x3       | T                | 10223   | 10223       |                     |
| 9           | B-3                  | 1 1/2          | 895                   | 136                | 160                  | 10000                | 3385                   | P30x5     | P32x6      | Own FAB2    | 6-3x4x4      | Own H-4-A      | U 4                         | Own                      | 720            | 2F          | H 5.29               | 33.8  | 7x2x3x3       | T                | 11279   | 11279       |                     |
| 10          | B4                   | 2              | 1045                  | 145                | 185                  | 12750                | 4055                   | B6.50/20  | DB6.50/20  | Own FAB-3   | 6-3x4x4      | Own H-4-A      | U 4                         | Own                      | 750            | 2F          | H 6.5                | 41.6  | 8x2x3x3       | T                | 13279   | 13279       |                     |
| 11          | A4                   | 2              | 1625                  | 145                | 185                  | 15750                | 5221                   | P32x6     | DP32x6     | Own FBB     | 6-3x4x4      | Own H-5        | U 5                         | Own                      | 902            | 2F          | H 6.50               | 47.8  | 7x3x3x3       | T                | 14312   | 14312       |                     |
| 12          | A5                   | 2              | 2100                  | 156                | 210                  | 18750                | 5895                   | P34x7     | DP34x7     | Own FBB     | 6-3x4x4      | Own H-5        | U 5                         | Own                      | 1022           | 2F          | H 7.16               | 64.7  | 8x3x3x3       | T                | 15390   | 15390       |                     |
| 13          | A6                   | 3              | 2450                  | 156                | 210                  | 20850                | 6120                   | P34x7     | DP34x7     | Own FBB     | 6-3x4x4      | Own H-5        | U 5                         | Own                      | 1150           | 2F          | H 8.5                | 76.8  | 8x3x3x3       | T                | 16328   | 16328       |                     |
| 14          | W23                  | 3 1/2          | 3900                  | 148                | 200                  | 24000                | 8450                   | S36x10    | S36x10     | Has 151     | 4-4x5x5      | Own H-6        | U 5                         | Own                      | 1200           | 2F          | H 6.85               | 83.9  | 9x3x3x3       | T                | 17390   | 17390       |                     |
| 15          | W3                   | 3 1/2          | 4850                  | 160                | 235                  | 28000                | 10125                  | S36x10    | S40x12     | Has 152     | 4-4x5x5      | Own H-7        | U 5                         | Own                      | 1300           | 2F          | H 7.87               | 70.5  | 8x3x3x3       | T                | 18390   | 18390       |                     |
| 16          | A7                   | 5-7 1/2        | 6200                  | 160                | 225                  | 37000                | 11590                  | B9.75/20  | DB9.75/20  | Own FDB     | 6-4x5x5      | Own H-7        | U 5                         | Own                      | 1301           | 2F          | H 6.37               | 57.2  | 12x4x3x3      | T                | 19390   | 19390       |                     |
| 17          | A8                   | 7 1/2          | 6300                  | 160                | 225                  | 37000                | 11590                  | B9.75/20  | DB9.75/20  | Own FDB     | 6-4x5x5      | Own H-7        | U 5                         | Own                      | 1301           | 2F          | H 6.37               | 57.2  | 12x4x3x3      | T                | 20390   | 20390       |                     |
| 18          | Kenworth             | 8 1/2-2        | 1120                  | 141                | 165                  | 10100                | 3400                   | B7.00/20  | B7.00/20   | Her JXA     | 6-3x4x4      | BL 214         | U 4                         | Op                       | Tia B370       | 2F          | H 6.5                | 34.6  | 5x4x3x3       | T                | 21390   | 21390       |                     |
| 19          | 88                   | 1 1/2          | 1480                  | 146                | 200                  | 13400                | 4400                   | P32x6     | DP32x6     | Her JXC     | 6-3x4x4      | BL 214         | U 4                         | Op                       | Tia 54300H     | 2F          | H 5.83               | 37.4  | 8x3x3x3       | T                | 22390   | 22390       |                     |
| 20          | 101B                 | 2-2 1/2        | 2050                  | 144                | 186                  | 13400                | 4700                   | B7.50/20  | DB7.50/20  | Bud H298    | 6-3x4x4      | BL 234         | U 4                         | Op                       | Tia 54300H     | 2F          | H 5.83               | 37.4  | 8x3x3x3       | T                | 23390   | 23390       |                     |
| 21          | 89                   | 2 1/2          | 1670                  | 146                | 200                  | 15000                | 4600                   | B7.50/20  | DB7.50/20  | Her JXC     | 6-3x4x4      | BL 234         | U 4                         | Op                       | Tia 56200H     | 2F          | H 6.16               | 40.7  | 8x2x3x3       | T                | 24390   | 24390       |                     |
| 22          | 127                  | 2-2 1/2        | 2600                  | 154                | 202                  | 16300                | 5490                   | B8.25/20  | DB8.25/20  | Her WXC     | 6-4x4x4      | BL 334         | U 4                         | Op                       | Tia 56200H     | 2F          | H 6.16               | 40.7  | 8x2x3x3       | T                | 25390   | 25390       |                     |
| 23          | 903                  | 3              | 1820                  | 146                | 200                  | 18200                | 5500                   | B7.50/20  | DB7.50/20  | Her JXC     | 6-3x4x4      | BL 234         | U 4                         | Op                       | Tia 58205H     | 2F          | H 6.83               | 43.8  | 8x3x3x3       | T                | 26390   | 26390       |                     |
| 24          | 148B                 | 3-4            | 3300                  | 158                | 206                  | 19500                | 5960                   | B9.00/20  | DB9.00/20  | Bud K393    | 6-4x4x4      | BL 334         | U 4                         | Op                       | Tia 58205H     | 2F          | H 6.83               | 43.8  | 8x2x3x3       | T                | 27390   | 27390       |                     |
| 25          | 166B                 | 3-4            | 3850                  | 156                | 204                  | 20700                | 6890                   | B9.00/20  | DB9.00/20  | Bud K393    | 6-4x4x4      | BL 334         | U 4                         | Op                       | Tia 58205H     | 2F          | H 6.83               | 43.8  | 8x2x3x3       | T                | 28390   | 28390       |                     |
| 26          | 166A                 | 3-4            | 4350                  | 156                | 204                  | 20700                | 6890                   | B9.00/20  | DB9.00/20  | Has 147     | 4-4x5        | BL 334         | U 4                         | Op                       | Tia 58205H     | 2F          | H 6.83               | 43.8  | 8x2x3x3       | T                | 29390   | 29390       |                     |
| 27          | 183                  | 4-5            | 4675                  | 155                | 221                  | 25600                | 7710                   | B9.75/20  | DB9.75/20  | Her YXC2    | 6-4x4x4      | BL 1554        | U 4                         | A 3                      | Tia 75720W     | 2F          | H 7.33               | 105.7 | 7-9x3x3       | T                | 30390   | 30390       |                     |
| 28          | 183                  | 4-5            | 4675                  | 155                | 221                  | 25600                | 7710                   | B9.75/20  | DB9.75/20  | Her YXC2    | 6-4x4x4      | BL 1554        | U 4                         | A 3                      | Tia 75720W     | 2F          | H 7.33               | 105.7 | 7-9x3x3       | T                | 31390   | 31390       |                     |
| 29          | 241A                 | 5-7            | 6500                  | 169                | 228                  | 27800                | 9500                   | B9.75/20  | DB9.75/20  | Has 160     | 6-4x5x5      | BL 714         | U 4                         | A 3                      | Tia 76720W     | 2F          | H 7.33               | 85.5  | 8x3x3x3       | T                | 32390   | 32390       |                     |
| 30          | 241B                 | 5-7            | 6150                  | 174                | 228                  | 27800                | 9500                   | B9.75/20  | DB9.75/20  | Bud GL6     | 6-4x5x6      | BL 714         | U 4                         | A 3                      | Tia 76720W     | 2F          | H 7.33               | 85.5  | 8x3x3x3       | T                | 33390   | 33390       |                     |
| 31          | 241C                 | 5-7            | 7200                  | 174                | 228                  | 27800                | 10000                  | B9.75/20  | DB9.75/20  | Has 175     | 6-5x6        | BL 714         | U 4                         | A 3                      | Tia 76720W     | 2F          | H 6.38               | 86.5  | 8x3x3x3       | T                | 34390   | 34390       |                     |
| 32          | Kelber               | 100            | 1450                  | 140                | 180                  | 10000                | 3950                   | B6.50/20  | DB6.50/20  | Con 18E     | 6-3x4x4      | BL 224         | U 4                         | No                       | Tia 53200H     | 2F          | H 6.5                | 34.0  | 5x4x3x3       | T                | 35390   | 35390       |                     |
| 33          | 100                  | 2-2 1/2        | 1450                  | 140                | 180                  | 10000                | 3950                   | B6.50/20  | DB6.50/20  | Con 18E     | 6-3x4x4      | BL 224         | U 4                         | No                       | Tia 53200H     | 2F          | H 6.5                | 34.0  | 5x4x3x3       | T                | 36390   | 36390       |                     |
| 34          | 120                  | 2-2 1/2        | 1950                  | 170                | 180                  | 15000                | 5150                   | B7.50/20  | DB7.50/20  | Con E600    | 6-3x4x4      | BL 324         | U 4                         | No                       | Tia 56200H     | 2F          | H 6.17               | 33.7  | 4x4x3x3       | T                | 37390   | 37390       |                     |
| 35          | 140                  | 3-5 1/2        | 2490                  | 180                | 180                  | 18000                | 6500                   | B8.25/20  | DB8.25/20  | Con E601    | 6-3x4x4      | BL 324         | U 4                         | No                       | Tia 58200H     | 2F          | H 7.1                | 38.7  | 7x4x3x3       | T                | 38390   | 38390       |                     |
| 36          | 210                  | 4-6            | 3800                  | 190                | 192                  | 23400                | 7600                   | B9.75/20  | DB9.75/20  | Con 21R     | 6-4x5x5      | BL 55          | U 4                         | No                       | EatDR2412H     | 2F          | H 7.25               | 42.0  | 7x4x3x3       | T                | 39390   | 39390       |                     |
| 37          | KD67                 | 6              | 6000                  | 206                | 210                  | 26000                | 9500                   | B9.75/20  | DB9.75/20  | Cum6HDie    | 6-4x5x6      | BL 714         | U 4                         | A 4                      | Eat 65041W     | 2F          | H 8.5                | 91.0  | 8x3x3x3       | T                | 40390   | 40390       |                     |
| 38          | La Fr. Republic      | C-2            | 1100                  | 150                | 162                  | 11000                | 3800                   | B6.00/20  | DB6.00/20  | Lyc SA      | 6-3x4x4      | WG T9          | U 4                         | Op                       | Tia 53200H     | 2F          | H 6.5                | 34.0  | 5x4x3x3       | T                | 41390   | 41390       |                     |
| 39          | D-2                  | 2-2 1/2        | 1485                  | 162                | 175                  | 14000                | 4600                   | B6.50/20  | DB6.50/20  | Lyc SB      | 6-3x4x4      | WG T9          | U 4                         | Op                       | Tia 53200H     | 2F          | H 6.5                | 34.0  | 5x4x3x3       | T                | 42390   | 42390       |                     |
| 40          | E-2                  | 2-2 1/2        | 2005                  | 162                | 190                  | 17000                | 5375                   | B32x6     | DP32x6     | Lyc ASD     | 6-3x4x4      | Fu Mlu-Bb      | U 4                         | No                       | Tia 56200H     | 2F          | H 7.4                | 47.0  | 7x3x3x3       | T                | 43390   | 43390       |                     |
| 41          | F-3                  | 3-4            | 2420                  | 174                | 198                  | 21000                | 6240                   | B32x6     | DP32x6     | Lyc ASD     | 6-3x4x4      | Fu Mlu-Bb      | U 4                         | No                       | Tia 56200H     | 2F          | H 7.4                | 47.0  | 7x3x3x3       | T                | 44390   | 44390       |                     |
| 42          | H-4                  | 4-5            | 3285                  | 179                | 206                  | 26000                | 7840                   | B9.75/20  | DB9.75/20  | Lyc TS      | 6-4x5x5      | Fu Mlu         | U 4                         | Op                       | Tia 75720W     | 2F          | H 8.15               | 64.0  | 8x3x3x3       | T                | 45390   | 45390       |                     |
| 43          | M-5                  | 5-6            | 4640                  | 174                | 198                  | 32000                | 8490                   | B10.50/20 | DB10.50/20 | Wau GSRL    | 6-4x5x5      | Fu VUOG        | U 5                         | No                       | Tia 76733H     | 2F          | H 8.55               | 62.5  | 9x4x3x3       | T                | 46390   | 46390       |                     |
| 44          | 35-7                 | 7-8            | 6570                  | 174                | 198                  | 35000                | 9700                   | B10.50/20 | DB10.50/20 | Wau 6-125   | 6-4x5x5      | Fu Mlu         | U 4                         | No                       | Tia 76720W     | 2F          | H 8.55               | 62.5  | 9x4x3x3       | T                | 47390   | 47390       |                     |
| 45          | Le Moon              | 150            | 1150                  | 140                | 152                  | 8000                 | 3300                   | B6.50/20  | DB6.50/20  | Con 20C     | 6-3x4x4      | BL 214         | U 4                         | No                       | Tia 53200H     | 2F          | H 6.5                | 34.0  | 6x4x3x3       | T                | 48390   | 48390       |                     |
|             |                      |                |                       |                    |                      |                      |                        |           |            |             |              |                |                             |                          |                |             |                      |       |               |                  |         |             |                     |



| Line Number | ENGINE DETAILS      |                   |                |                     |                                 |                   |                |                 |                     |               | FUEL SYST. | ELEC-TRICAL | FRONT AXLE | BRAKES           |           | BODY MOUNTING DATA   |                         | SPRINGS              |               | Auxiliary Type |                |                    |         |             |                      |                |       |      |               |                     |                      |
|-------------|---------------------|-------------------|----------------|---------------------|---------------------------------|-------------------|----------------|-----------------|---------------------|---------------|------------|-------------|------------|------------------|-----------|----------------------|-------------------------|----------------------|---------------|----------------|----------------|--------------------|---------|-------------|----------------------|----------------|-------|------|---------------|---------------------|----------------------|
|             | Piston Displacement | Compression Ratio | Torque lb. ft. | N.A.C.C. Rated H.P. | Max. Brake H.P. at R.P.M. Given | Valve Arrangement | Camshaft Drive | MAIN BEARINGS   |                     | Governor Make |            |             |            | Carburetors Make | Fuel Feed | Ignition System Make | Generator, Starter Make | Clutch Type and Make | Radiator Make |                | Universal Make | Steering Gear Make | SERVICE |             | Cab to Rear of Frame | Width of Frame | Front | Rear |               |                     |                      |
|             |                     |                   |                |                     |                                 |                   |                | Piston Material | Number and Diameter |               |            |             |            |                  |           |                      |                         |                      |               |                |                |                    | Length  | Lining Area |                      |                |       |      | Drum Material | Hand Location, Type | Cab to Rear of Frame |
| 1762        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1763        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1764        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1765        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1766        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1767        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1768        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1769        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1770        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1771        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1772        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1773        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1774        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1775        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1776        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1777        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1778        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1779        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1780        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1781        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1782        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1783        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1784        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1785        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1786        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1787        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1788        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1789        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1790        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1791        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1792        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1793        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1794        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1795        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1796        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1797        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1798        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1799        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |
| 1800        | 17                  | 420               | 57             | 0                   | 125-1800                        | H                 | G              | N               | 7-3/4               | 17            | CC         | En          | No         | Til              | M         | AL                   | LN                      | dp.BL                | Yo            | Spi            | Shu 1633W      | Ros                | Wd41A   | 560G        | CD                   | 144            | 90    | 34   | 40x3          | 54x3                |                      |

| Line Number | MAKE AND MODEL   | Wheels Driven—4-Wheelers<br>Tonnage Rating | GENERAL (See Keynote) |  | TIRE SIZE            |                        | MAJOR UNITS |            |                          |                                     |                                |   |                |               |        |               | FRAME                                 |             |                      |      |
|-------------|------------------|--|-----------------------|--|----------------------|------------------------|-------------|------------|--------------------------|-------------------------------------|--------------------------------|---|----------------|---------------|--------|---------------|---------------------------------------|-------------|----------------------|------|
|             |                  |  | Chassis Price         | Standard Wheelbase<br>Max. W. B. Furnished | Gross Vehicle Weight | Chassis Wt. (Stripped) | Front       | Rear       | ENGINE<br>Make and Model | No. of Cylinders<br>Bore and Stroke | TRANSMISSION<br>Make and Model | REAR AXLE   |                |               |        | Gear and Type | Drive and Torque<br>In High<br>In Low | GEAR RATIOS | Side Rail Dimensions | Type |
|             |                  |  |                       |  |                      |                        |             |            |                          |                                     |                                | Location and Forward Speeds<br>Aux. Location and Speeds | Make and Model | Gear and Type |        |               |                                       |             |                      |      |
| 1           | Schacht (conc'd) | 30HA 4-6                                   | 3295                  | 146 227                                    | 23000                | 6800                   | B9.75/20    | DB9.75/20  | Her WXC                  | 6-4x4 1/2                           | Fu MGU                         | U4  | No             | Wls           | 2F     | R 7.14        | 46.4                                  | 7x3x1/4     | P                    |      |
| 2           |                  | 35HA 5-7                                   | 3725                  | 146 227                                    | 24000                | 7400                   | B9.75/20    | DB9.75/20  | Her WXC2                 | 6-4 1/2x4 1/2                       | Fu MGU                         | U4  | No             | Own           | 2F     | R 8.00        | 52.0                                  | 8 1/2x3x1/4 | P                    |      |
| 3           |                  | 40H 5-7                                    | 4295                  | 154 235                                    | 25500                | 7600                   | B9.75/20    | DB9.75/20  | Her YXC                  | 6-4x4 1/2                           | Fu 5A-53                       | U5  | No             | Own           | 2F     | R 7.07        | 49.7                                  | 8 1/2x3x1/4 | P                    |      |
| 4           |                  | 40HB 7-9                                   | 4695                  | 154 235                                    | 29500                | 7750                   | B10.50/20   | DB10.50/20 | Her YXC                  | 6-4x4 1/2                           | Fu 5A-53                       | U5  | No             | Wls           | 2F     | R 7.07        | 49.7                                  | 8 1/2x3x1/4 | P                    |      |
| 5           |                  | 66HA 8-11                                  | 5895                  | 152 247                                    | 35000                | 9820                   | B10.50/24   | DB10.50/24 | Her RXC                  | 6-4x4 1/2                           | Fu 5A-53                       | U5  | No             | Wls           | 2F     | R 7.07        | 49.7                                  | 8 1/2x3x1/4 | P                    |      |
| 6           |                  | (T) TRDA 10                                | 3895                  | 148 174                                    | 39000                | 6450                   | B9.75/20    | DB9.75/20  | Her YXC3                 | 6-4x4 1/2                           | Fu 5A-53                       | U5  | No             | Own           | 2F     | R 7.8         | 56.8                                  | 7x3x1/4     | P                    |      |
| 7           | Sterling         | FB40 1 1/2-2                               | 1135                  | 142 162                                    | 11000                | 3450                   | B6.50/20    | DB6.50/20  | Con 25A                  | 6-3x4 1/2                           | WG T9                          | U4  | No             | Own           | BF     | H 5.66        | 36.2                                  | 6x2x1/4     | C                    |      |
| 8           |                  | FB50 2-2 1/2                               | 1240                  | 142 162                                    | 11500                | 3650                   | B7.00/20    | DB7.00/20  | Con 25A                  | 6-3x4 1/2                           | WG T9                          | U4  | No             | Own           | BF     | H 5.66        | 36.2                                  | 6x2x1/4     | C                    |      |
| 9           |                  | FB60 2 1/2-3                               | 1590                  | 142 162                                    | 14000                | 4150                   | B7.00/20    | DB7.00/20  | Wau TL                   | 6-3x4 1/2                           | WG T9                          | U4  | No             | Own           | BF     | H 5.83        | 37.3                                  | 6x2x1/4     | C                    |      |
| 10          |                  | FB70 2 1/2-3 1/2                           | 2635                  | 174 204                                    | 17000                | 5755                   | B7.50/20    | B7.50/20   | Wau ML                   | 6-4x4 1/2                           | Own UC7                        | U5  | No             | Own           | BF     | R 7.4         | 52.7                                  | 10x3x1/4    | L                    |      |
| 11          |                  | FD80 3-4                                   | 3065                  | 174 204                                    | 21000                | 6680                   | B8.25/20    | DB8.25/20  | Wau GML                  | 6-4x4 1/2                           | Own UC7                        | U5  | Op             | Own           | BF     | R 7.8         | 55.3                                  | 10x3x1/4    | L                    |      |
| 12          |                  | FB80 Spec                                  | 3010                  | 174 204                                    | 21000                | 6680                   | B8.25/20    | B8.25/20   | Wau ML                   | 6-4x4 1/2                           | Own UC7                        | U5  | No             | Own           | BF     | R 7.8         | 55.3                                  | 10x3x1/4    | L                    |      |
| 13          |                  | FC90 4                                     | 4105                  | 174 204                                    | 22000                | 7480                   | B9.00/20    | DB9.00/20  | Wau GML                  | 6-4x4 1/2                           | Own UC7                        | U5  | Op             | Own           | CD     | R 8.66        | 61.7                                  | 10x3x1/4    | L                    |      |
| 14          |                  | FD40 4                                     | 3315                  | 174 204                                    | 22000                | 7480                   | B9.00/20    | B9.00/20   | Wau MK                   | 6-4x4 1/2                           | Own UC7                        | U5  | No             | Own           | 2F     | R 8.0         | 57.0                                  | 10x3x1/4    | L                    |      |
| 15          |                  | FW97S, FD97S 4-5                           | 4355                  | 192 222                                    | 26000                | 8200                   | P36x8       | DP36x8     | Wau 6SRL                 | 6-4x4 1/2                           | Own UC2                        | U4  | Op             | Own           | w/2F   | R 7.75        | 51.6                                  | 12x3x1/4    | L                    |      |
| 16          |                  | FC100 5-5 1/2                              | 4185                  | 192 222                                    | 26000                | 7750                   | P36x8       | DP36x8     | Wau 6MK                  | 6-4x4 1/2                           | Own UC2                        | U4  | Op             | Own           | CD     | R 9.3         | 61.2                                  | 12x3x1/4    | L                    |      |
| 17          |                  | FW115, FD115 5-5 1/2                       | 4690                  | 192 222                                    | 32000                | 8750                   | P40x8       | DP40x8     | Wau 6SRL                 | 6-4x4 1/2                           | Own UC2                        | U4  | Op             | Own           | w/2F   | R 8.20        | 54.6                                  | 12x3x1/4    | L                    |      |
| 18          |                  | FC107 5-6                                  | 4700                  | 192 222                                    | 27000                | 8200                   | P36x8       | DP36x8     | Wau 6SRL                 | 6-4x4 1/2                           | Own UC2                        | U4  | Op             | Own           | CD     | R 8.20        | 54.6                                  | 12x3x1/4    | L                    |      |
| 19          |                  | FW140, FD140 7-8                           | 6005                  | 192 222                                    | 35000                | 10050                  | P40x8       | DP42x9     | Wau SRL                  | 6-4x4 1/2                           | Own UC2                        | U4  | Op             | Own           | w/2F   | R 10.0        | 66.6                                  | 15x3x1/4    | L                    |      |
| 20          |                  | FC135 7-8                                  | 4800                  | 192 222                                    | 35000                | 8900                   | P40x8       | DP40x8     | Wau SRL                  | 6-4x4 1/2                           | Own UC2                        | U4  | Op             | Own           | CD     | R 9.3         | 61.2                                  | 15x3x1/4    | L                    |      |
| 21          |                  | FC145 8-8 1/2                              | 5595                  | 200 230                                    | 36000                | 9350                   | P40x8       | DP40x8     | Wau HB                   | 6-4x4 1/2                           | Own UC2                        | U4  | Op             | Own           | CD     | R 8.3         | 55.2                                  | 15x3x1/4    | L                    |      |
| 22          |                  | FC145 8-8 1/2                              | 6180                  | 200 230                                    | 37000                | 10100                  | P40x8       | DP40x8     | Wau AB                   | 6-4x4 1/2                           | Own UC8                        | U4  | Op             | Own           | CD     | R 9.4         | 58.9                                  | 15x3x1/4    | L                    |      |
| 23          |                  | FW170, FD170 9-10 1/2                      | 6980                  | 200 230                                    | 40000                | 10550                  | P40x8       | DP44x10    | Wau AB                   | 6-4 1/2x5 1/2                       | Own UC8                        | U4  | Op             | Own           | w/2F   | R 10.0        | 62.7                                  | 15x3x1/4    | L                    |      |
| 24          |                  | FC170 9-10 1/2                             | 6900                  | 200 230                                    | 40000                | 10550                  | P40x8       | DP42x9     | Wau RB                   | 6-5x5 1/2                           | Own UC8                        | U4  | Op             | Own           | CD     | R 9.4         | 58.9                                  | 15x3x1/4    | L                    |      |
| 25          |                  | FD195 12-12 1/2                            | 8925                  | 200 230                                    | 39000                | 10750                  | B10.50/20   | DB10.50/20 | Cum H Die                | 6-4x4 1/2                           | BL 734                         | U4  | Op             | Wls 1910W     | 2F     | R 8.88        | 55.8                                  | 15x3x1/4    | L                    |      |
| 26          | Stewart          | 41X 3/4                                    | 670                   | 124 124                                    | 2875                 | B6.50/18               | B6.50/18    | Lyc        | 6-3x4 1/2                | WG                                  | U4                             | No  | Cla            | SF            | H 5.4  | 35.1          | 6x2x1/4                               | T           |                      |      |
| 27          |                  | 41X 3/4                                    | 680                   | 134 145                                    | 2925                 | B6.50/18               | B6.50/18    | Lyc        | 6-3x4 1/2                | WG                                  | U4                             | No  | Cla            | SF            | H 5.4  | 35.1          | 6x2x1/4                               | T           |                      |      |
| 28          |                  | 44X 1 1/4                                  | 795                   | 134 176                                    | 3250                 | B6.50/20               | B6.50/20    | Lyc        | 6-3x4 1/2                | WG                                  | U4                             | No  | Cla            | SF            | H 5.61 | 35.8          | 7x2x1/4                               | T           |                      |      |
| 29          |                  | 42X 1 1/4                                  | 695                   | 145 176                                    | 3525                 | B6.50/20               | B6.50/20    | Lyc        | 6-3x4 1/2                | WG                                  | U4                             | No  | Cla            | SF            | H 5.61 | 35.8          | 7x2x1/4                               | T           |                      |      |
| 30          |                  | 43X 2                                      | 905                   | 145 176                                    | 4005                 | B6.50/20               | DB6.50/20   | Lyc        | 6-3x4 1/2                | WG                                  | U4                             | No  | Cla            | SF            | H 5.61 | 35.8          | 7x2x1/4                               | T           |                      |      |
| 31          |                  | 45X 2                                      | 1295                  | 145 190                                    | 4350                 | B6.50/20               | DB6.50/20   | Lyc        | 6-3x4 1/2                | WG                                  | U4                             | No  | Cla            | SF            | R 6.37 | 44.4          | 7x2x1/4                               | T           |                      |      |
| 32          |                  | 29X 2 1/2                                  | 1695                  | 145 220                                    | 5190                 | B7.00/20               | DB7.00/20   | Lyc        | 6-3x4 1/2                | BL                                  | U5                             | No  | Cla            | SF            | R 6.37 | 44.4          | 7x2x1/4                               | T           |                      |      |
| 33          |                  | 32X 3                                      | 1990                  | 165 220                                    | 5460                 | B7.00/20               | DB7.00/20   | Lyc        | 6-3x4 1/2                | BL                                  | U5                             | No  | Cla            | SF            | R 6.37 | 44.4          | 9x2x1/4                               | T           |                      |      |
| 34          |                  | 31X 5-8                                    | 2190                  | 170 226                                    | 6025                 | B7.50/20               | DB7.50/20   | Lyc        | 6-3x4 1/2                | Fu                                  | U5                             | No  | Cla            | SF            | R 7.1  | 47.0          | 9x2x1/4                               | T           |                      |      |
| 35          |                  | 18X 3 1/2                                  | 2690                  | 165 220                                    | 20000                | 6600                   | B7.50/20    | DB7.50/20  | Lyc                      | 6-3x4 1/2                           | Fu                             | U5  | No             | Tim           | WF     | R 7.25        | 47.5                                  | 9x2x1/4     | T                    |      |
| 36          |                  | 48-3 1/2                                   | 2990                  | 170 241                                    | 20000                | 6750                   | B8.25/20    | DB8.25/20  | Lyc                      | 6-3x4 1/2                           | BL                             | U5  | No             | Cla           | WF     | R 7.1         | 50.1                                  | 9x2x1/4     | T                    |      |
| 37          |                  | 19X 3 1/2                                  | 3690                  | 165 235                                    | 20000                | 7110                   | B9.00/20    | DB9.00/20  | Lyc                      | 6-3x4 1/2                           | Fu                             | U4  | A 3            | Tim           | WF     | R 7.25        | 127                                   | 9x2x1/4     | T                    |      |
| 38          |                  | 38-3 1/2-5                                 | 3990                  | 170 241                                    | 23000                | 7600                   | B9.00/20    | DB9.00/20  | Wau                      | 6-4x4 1/2                           | BL                             | U5  | A 3            | Tim           | WF     | R 7.25        | 147                                   | 9x2x1/4     | T                    |      |
| 39          |                  | 38-3 1/2-5                                 | 3990                  | 170 241                                    | 23000                | 7600                   | B9.00/20    | DB9.00/20  | Lyc                      | 6-4x4 1/2                           | BL                             | U5  | A 3            | Tim           | WF     | R 7.25        | 147                                   | 9x2x1/4     | T                    |      |
| 40          |                  | 21X 5-8                                    | 5190                  | 165 235                                    | 9340                 | B9.75/20               | DB9.75/20   | Wau        | 6-4x4 1/2                | BL                                  | U4                             | A 3   | Tim            | WF            | R 8.2  | 15.1          | 9x2x1/4                               | T           |                      |      |
| 41          |                  | 27X 5-8                                    | 6190                  | 165 235                                    | 35000                | 10300                  | B10.50/24   | DB10.50/24 | Lyc                      | 6-4x4 1/2                           | BL                             | U4  | A 3            | Tim           | WF     | R 10.1        | 193.8                                 | 9x2x1/4     | T                    |      |
| 42          | Studebaker       | (1) 8-2 1/2-2                              | 670                   | 130 165                                    | 9000                 | 3110                   | B6.00/20    | P32x6      | Own                      | 6-3x4 1/2                           | WG T9                          | U4  | No             | Cla B373      | SF     | H 5.66        | 36.2                                  | 7x2x1/4     | T                    |      |
| 43          |                  | (2) 8-2 1/2-2 1/2                          | 745                   | 130 165                                    | 10500                | 3445                   | B6.00/20    | DB6.50/20  | Own                      | 6-3x4 1/2                           | WG T9                          | U4  | No             | Cla B412      | SF     | H 5.6         | 43.5                                  | 7x2x1/4     | T                    |      |
| 44          |                  | 8-2 1/2-3                                  | 945                   | 141 165                                    | 12000                | 4095                   | B6.50/20    | DB6.50/20  | Own                      | 6-3x4 1/2                           | WG T9                          | U4  | No             | Tim 54200     | SF     | H 6.8         | 43.5                                  | 7x2x1/4     | T                    |      |
| 45          |                  | 8-2 1/2-3                                  | 1395                  | 141 183                                    | 15000                | 4875                   | B6.50/20    | DB6.50/20  | Own                      | 6-3x4 1/2                           | WG T9                          | U4  | A 2            | Tim 58200     | SF     | H 7.8         | 75.8                                  | 8x2x1/4     | T                    |      |
| 46          | Walter           | FN 2 1/2-3                                 | 5500                  | 120 144                                    | 6500                 | B9.00/20               | DB9.00/20   | Own 6MK    | 6-4x4 1/2                | Own FN                              | U5                             | No  | Own FM         | 2D            | H 7.0  | 70.0          | 7x2x1/4                               | T           |                      |      |
| 47          | (all 4 Wh.Dr.)   | FKD 4-6                                    | 6300                  | 118 136                                    | 24000                | 8500                   | B9.00/24    | DB9.00/24  | Own 6SRL                 | 6-4x4 1/2                           | Own FM                         | U5  | No             | Own FM        | 2D     | H 6.0         | 60.0                                  | 12x2x1/4    | P                    |      |
| 48          |                  | FKD 4-6                                    | 6300                  | 118 136                                    | 24000                | 8500                   | B9.00/24    | DB9.00/24  | Own 6SRL                 | 6-4x4 1/2                           | Own FM                         | U5  | No             | Own FK        | 2D     | H 8.5         | 85.0                                  | 11x3x1/4    | P                    |      |
| 49          |                  | FC5 4-6                                    | 7200                  | 136 160                                    | 27000                | 9500                   | B9.75/24    | DB9.75/24  | Own 6SRL                 | 6-4x4 1/2                           | Own FK                         | U5  | No             | Own FK        | 2D     | H 8.5         | 85.0                                  | 13x3x1/4    | P                    |      |
| 50          |                  | FBS 5-7                                    | 7900                  | 136 160                                    | 27000                | 9500                   | B9.75/24    | DB9.75/24  | Own 6RB                  | 6-5x5 1/2                           | Own FH                         | U5  | No             | Own FH        | 2D     | H 8.5         | 85.0                                  | 13x3x1/4    | P                    |      |
| 51          |                  | FBR5 7-9                                   | 8300                  | 136 160                                    | 32000                | 10500                  | B10.50/24   | DB10.50/24 | Own 6RB                  | 6-5x5 1/2                           | Own FH                         | U5  | No             | Own FHR       | 2D     | H 8.5         | 85.0                                  | 13x3x1/4    | P                    |      |
| 52          | Ward La Fr.      | 25R14 2 1/2                                | 2800                  | 176 208                                    | 14000                | 6000                   | B7.50/20    | DB7.50/20  | Wau ML                   | 6-4x4 1/2                           | BL 324                         |   |                |               |        |               |                                       |             |                      |      |



| Line Number | ENGINE DETAILS      |                   |                |                   |                                 |                   |                |                 |                     |        | MAIN BEARINGS | FUEL SYST. | ELEC-TRICAL | FRONT AXLE | BRAKES | BODY MOUNTING DATA |               |                  |           | SPRINGS              |                         |                      |               |                |                |                    |         |                               |             |               |                     |                      |                  |
|-------------|---------------------|-------------------|----------------|-------------------|---------------------------------|-------------------|----------------|-----------------|---------------------|--------|---------------|------------|-------------|------------|--------|--------------------|---------------|------------------|-----------|----------------------|-------------------------|----------------------|---------------|----------------|----------------|--------------------|---------|-------------------------------|-------------|---------------|---------------------|----------------------|------------------|
|             | Piston Displacement | Compression Ratio | Torque lb. ft. | N.A.C. Rated H.P. | Max. Brake H.P. at R.P.M. Given | Valve Arrangement | Camshaft Drive | Piston Material | Number and Diameter | Length |               |            |             |            |        | Oiling System Type | Governor Make | Carburetors Make | Fuel Feed | Ignition System Make | Generator, Starter Make | Clutch Type and Make | Radiator Make | Universal Make | Make and Model | Steering Gear Make | Service | Make, Location Type Operation | Lining Area | Drum Material | Hand Location, Type | Cab to Rear of Frame | Cab to Rear Axle |
| 13391       | 7.225               | 38.4              | 73-2200        | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 658H             | G         | TX                   | 106                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13392       | 7.238               | 40.3              | 93-2200        | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 768H             | H         | TD                   | 106                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13393       | 7.280               | 45.9              | 93-2200        | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 893G             | H         | TD                   | 106                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13394       | 7.355               | 51.2              | 115-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 847G             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13395       | 7.382               | 54.8              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13396       | 7.410               | 58.4              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13397       | 7.438               | 62.0              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13398       | 7.466               | 65.6              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13399       | 7.494               | 69.2              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13400       | 7.522               | 72.8              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13401       | 7.550               | 76.4              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13402       | 7.578               | 80.0              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13403       | 7.606               | 83.6              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13404       | 7.634               | 87.2              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13405       | 7.662               | 90.8              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13406       | 7.690               | 94.4              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13407       | 7.718               | 98.0              | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13408       | 7.746               | 101.6             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13409       | 7.774               | 105.2             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13410       | 7.802               | 108.8             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13411       | 7.830               | 112.4             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13412       | 7.858               | 116.0             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13413       | 7.886               | 119.6             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13414       | 7.914               | 123.2             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13415       | 7.942               | 126.8             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13416       | 7.970               | 130.4             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13417       | 8.000               | 134.0             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13418       | 8.028               | 137.6             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13419       | 8.056               | 141.2             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13420       | 8.084               | 144.8             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13421       | 8.112               | 148.4             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13422       | 8.140               | 152.0             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13423       | 8.168               | 155.6             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13424       | 8.196               | 159.2             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13425       | 8.224               | 162.8             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13426       | 8.252               | 166.4             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13427       | 8.280               | 170.0             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13428       | 8.308               | 173.6             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13429       | 8.336               | 177.2             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13430       | 8.364               | 180.8             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13431       | 8.392               | 184.4             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13432       | 8.420               | 188.0             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13433       | 8.448               | 191.6             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13434       | 8.476               | 195.2             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       | 50x3           | 50x3               | 50x3    | 50x3                          | 50x3        | 50x3          | 50x3                | 50x3                 | 50x3             |
| 13435       | 8.504               | 198.8             | 102-2200       | L                 | G                               | C                 | CC             | Mo              | Str                 | MAL    | AL            | D.Fu       | Yo          | Spi        | Tim    | Ros                | LAIHV         | 883H             | H         | TD                   | 118                     | Opt                  | 31 1/4        | 40x2 1/4       |                |                    |         |                               |             |               |                     |                      |                  |



| Line Number | MAKE AND MODEL    | Wheels Driven—6-Wheelers | GENERAL (See Keynote) |               |                    |                      | TIRE SIZE            |                        | MAJOR UNITS |            |                 |                                  |                |                             | FRAME                    |                |               |               |                |                      |
|-------------|-------------------|--------------------------|-----------------------|---------------|--------------------|----------------------|----------------------|------------------------|-------------|------------|-----------------|----------------------------------|----------------|-----------------------------|--------------------------|----------------|---------------|---------------|----------------|----------------------|
|             |                   |                          | Tonnage Rating        | Chassis Price | Standard Wheelbase | Max. W. B. Furnished | Gross Vehicle Weight | Chassis Wt. (Stripped) | Front       | Rear       | ENGINE          |                                  | TRANSMISSION   |                             | REAR AXLE                |                |               |               |                |                      |
|             |                   |                          |                       |               |                    |                      |                      |                        |             |            | Make and Model  | No. of Cylinders Bore and Stroke | Make and Model | Location and Forward Speeds | Aux. Location and Speeds | Make and Model | Gear and Type | GEAR RATIOS   |                |                      |
|             |                   |                          |                       |               |                    |                      |                      |                        |             |            |                 |                                  |                |                             |                          |                |               | In High       | In Low         | Side Rail Dimensions |
|             |                   |                          |                       |               |                    |                      |                      |                        |             |            |                 |                                  |                |                             |                          |                |               |               | Type           |                      |
| 1           | (6) Gen. Mo. T95  | 4R                       | 9-11                  | 7695          | 189                | 224                  | 40000                | 13250                  | P34x7       | DP34x7     | Ow 525          | 6-4 1/2 x 5 1/2                  | Ow 525         | U4 Op                       | Ow 525                   | WF             | R 8.50        | 53.37         | 9 1/4 x 4 1/4  | L                    |
| 2           | Ind. 958BT-151    | 2C                       | 12-15                 | 9490          | 189                | 224                  | 50000                | 14545                  | B9.75/20    | DB9.75/20  | Ow 616          | 6-4 1/2 x 5 1/2                  | Ow 616         | U4 A 3                      | Ow 616                   | WF             | R 9.50        | 119           | 9 1/4 x 4 1/4  | L                    |
| 3           | 95SW 75           | 4R                       | 3                     | 1900          | 168                | 186                  | 20000                | 5800                   | P32x6       | DP32x6     | Her JXC         | 6-3 3/4 x 4 1/4                  | BL 224         | U4 No                       | Tim SBT151               | SF             | T 7.4         | 45.8          | 7 1/2 x 3 1/2  | T                    |
| 4           | 17SBT251          | 2C                       | 4                     | 3500          | 188                | 224                  | 28000                | 8850                   | P34x7       | DP34x7     | Her JXC         | 6-4 1/2 x 5 1/2                  | BL 524         | U4 Op                       | Tim SBT251               | SF             | T 6.1         | 37.8          | 8 1/2 x 3 1/2  | TL                   |
| 5           | 17SW251           | 4R                       | 4                     | 3900          | 188                | 224                  | 28000                | 9500                   | P34x7       | DP34x7     | Her JXC         | 6-4 1/2 x 5 1/2                  | BL 524         | U4 Op                       | Tim SW251                | WF             | T 6.2         | 38.1          | 8 1/2 x 3 1/2  | TL                   |
| 6           | 12X4              | 4R                       | 1 1/2                 | 2650          | 141                | 10000                | 4350                 | B6.50/20               | DB6.50/20   | Her JXC    | 6-3 3/4 x 4 1/4 | BL                               | U4 A 2         | Wls                         | SF                       | H 5.14         | 54.07         | 7 1/2 x 3 1/2 | C              |                      |
| 7           | 14X4              | 4R                       | 2 1/2                 | 3950          | 141                | 14000                | 5900                 | B7.50/20               | DB7.50/20   | Her WXB    | 6-3 3/4 x 4 1/4 | BL                               | U4 A 2         | Wls                         | SF                       | H 5.40         | 50.07         | 7 1/2 x 3 1/2 | C              |                      |
| 8           | 16X4              | 4R                       | 3 1/2                 | 4850          | 156                | 16000                | 7500                 | B8.25/20               | DB8.25/20   | Her WXC2   | 6-4 1/2 x 5 1/2 | BL                               | U4 U 2         | Wls                         | 2F                       | H 6.06         | 89.0          | 8 1/2 x 3 1/2 | C              |                      |
| 9           | 18X4              | 4R                       | 4 1/2                 | 5650          | 170                | 20000                | 8000                 | B7.00/20               | DB7.00/20   | Her RXB    | 6-4 1/2 x 5 1/2 | BL                               | U4 U 2         | Wls                         | 2F                       | H 4.66         | 83.34         | 8 1/2 x 3 1/2 | C              |                      |
| 10          | 18X4              | 4R                       | 3 1/2                 | 5850          | 160                | 21000                | 9000                 | B9.00/20               | DB9.00/20   | Her JXC    | 6-4 1/2 x 5 1/2 | BL                               | U4 A 2         | Wls                         | 2F                       | H 7.83         | 110           | 8 1/2 x 3 1/2 | C              |                      |
| 11          | 18X6              | 6                        | 3 1/2                 | 6650          | 170                | 28000                | 10500                | B8.25/20               | DB8.25/20   | Her RXC    | 6-4 1/2 x 5 1/2 | BL                               | U4 A 2         | Wls                         | 2F                       | H 7.83         | 110           | 8 1/2 x 3 1/2 | C              |                      |
| 12          | 20X4              | 4R                       | 4 1/2                 | 7200          | 188                | 24000                | 10600                | B9.75/20               | DB9.75/20   | Her HXB    | 6-5 1/2 x 6     | BL                               | U4 A 2         | Wls                         | 2F                       | H 8.00         | 128           | 9 1/4 x 3 1/2 | C              |                      |
| 13          | 20X6              | 6                        | 4 1/2                 | 8950          | 188                | 36000                | 14000                | B9.00/20               | DB9.00/20   | Her HXC    | 6-5 1/2 x 6     | BL                               | U4 A 2         | Wls                         | 2F                       | H 8.95         | 84.0          | 9 1/4 x 3 1/2 | C              |                      |
| 14          | 22X4              | 4R                       | 5                     | 10000         | 200                | 31000                | 14000                | B10.50/20              | DB10.50/20  | Her HXC    | 6-5 1/2 x 6     | BL                               | U4 A 2         | Wls                         | 2F                       | H 9.11         | 86.0          | 9 1/4 x 3 1/2 | C              |                      |
| 15          | 22X6              | 6                        | 5                     | 12000         | 200                | 40000                | 16000                | B9.75/20               | DB9.75/20   | Her HXD    | 6-5 1/2 x 6     | BL                               | U4 A 2         | Wls                         | 2F                       | H 9.11         | 86.0          | 9 1/4 x 3 1/2 | C              |                      |
| 16          | Ken. 89SBT        | 7                        | 8                     | 2380          | 188                | 224                  | 25500                | 7350                   | P32x6       | DP32x6     | Her JXC         | 6-3 3/4 x 4 1/4                  | BL 234         | U4 Op                       | Tim SBT151               | SF             | A 7.4         | 45.5          | 8 1/2 x 3 1/2  | TL                   |
| 17          | 127SBT            | 8                        | 8                     | 3450          | 188                | 224                  | 26000                | 8000                   | B8.25/20    | DB8.25/20  | Her WXC2        | 6-4 1/2 x 5 1/2                  | BL 334         | U4 Op                       | Tim SBT151               | SF             | A 7.4         | 45.5          | 8 1/2 x 3 1/2  | TL                   |
| 18          | 146SBT            | 9                        | 9                     | 4250          | 188                | 224                  | 33000                | 9000                   | B9.00/20    | DB9.00/20  | Bud K393        | 6-4 1/2 x 5 1/2                  | BL 334         | U4 Op                       | Tim SBT251               | SF             | A 7.8         | 48            | 8 1/2 x 3 1/2  | TL                   |
| 19          | 186SDT            | 2C                       | 10                    | 6450          | 205                | 235                  | 38000                | 10500                  | B9.00/20    | DB9.00/20  | Her JXC         | 6-4 1/2 x 5 1/2                  | BL 1554        | U4 A 3                      | Tim Sdt310W              | SF             | H 7.33        | 104           | 9 1/4 x 3 1/2  | T                    |
| 20          | 241SDT            | 2C                       | 10                    | 6850          | 205                | 235                  | 40500                | 11000                  | B9.00/20    | DB9.00/20  | Her RXB         | 6-4 1/2 x 5 1/2                  | BL 714         | U4 A 3                      | Tim Sdt310W              | 2F             | H 7.33        | 85.5          | 9 1/4 x 3 1/2  | T                    |
| 21          | 346A              | 4R                       | 10                    | 8800          | 210                | 240                  | 40500                | 13000                  | B9.75/20    | DB9.75/20  | Has 160         | 6-4 1/2 x 5 1/2                  | BL 714         | U4 A 3                      | Tim SW310W               | WF             | H 7.25        | 98.4          | 8 1/2 x 3 1/2  | C                    |
| 22          | 346B              | 4R                       | 10                    | 8550          | 210                | 240                  | 40500                | 13000                  | B9.75/20    | DB9.75/20  | Her GF-6        | 6-4 1/2 x 5 1/2                  | BL 714         | U4 A 3                      | Tim SW310W               | WF             | H 7.25        | 98.4          | 8 1/2 x 3 1/2  | C                    |
| 23          | 346C              | 4R                       | 10                    | 9500          | 210                | 240                  | 40500                | 14000                  | B9.75/20    | DB9.75/20  | Has 175         | 6-5 1/2 x 6                      | BL 714         | U4 A 3                      | Tim SW310W               | WF             | H 7.25        | 98.4          | 8 1/2 x 3 1/2  | C                    |
| 24          | 386C              | 4R                       | 10                    | 10200         | 210                | 240                  | 50100                | 14500                  | B9.75/20    | DB9.75/20  | Has 175         | 6-5 1/2 x 6                      | BL 714         | U4 A 3                      | Tim SW410W               | WF             | H 7.60        | 103           | 8 1/2 x 3 1/2  | C                    |
| 25          | La Fran-R. Q6     | 4R                       | 9-12                  | 11605         | 216                | 260                  | 40000                | 14900                  | B10.50/20   | DB10.50/20 | Ow 312B         | 12-4x5                           | BL 714         | U4 No                       | Tim SWD410               | WF             | Opt Opt       | 12x3 1/2      | L              |                      |
| 26          | Le Moon (9) 701   | 4R                       | 5-6                   | 4475          | 187                | 199                  | 25500                | 8500                   | B8.25/20    | DB8.25/20  | Lyc AEC         | 8-3 3/4 x 4 1/4                  | Fu VUOG        | U5 No                       | Tim 63703-97H            | WF             | R 6.20        | 43.8          | 7 1/2 x 3 1/2  | B                    |
| 27          | 801               | 4R                       | 6-7                   | 5100          | 187                | 199                  | 32500                | 9720                   | B9.00/20    | DB9.00/20  | Lyc AEC         | 8-3 3/4 x 4 1/4                  | Fu VUOG        | U5 No                       | Tim 63703-97H            | WF             | H 6.75        | 47.7          | 7 1/2 x 3 1/2  | B                    |
| 28          | 802               | 4R                       | 6-7                   | 5350          | 187                | 199                  | 32500                | 9800                   | B9.00/20    | DB9.00/20  | Wau 6SR         | 6-4 1/2 x 5 1/2                  | Fu VUOG        | U5 No                       | Tim 63703-97H            | WF             | H 6.75        | 47.7          | 7 1/2 x 3 1/2  | B                    |
| 29          | 803               | 4R                       | 6-7                   | 5775          | 191                | 203                  | 36000                | 12000                  | B9.75/20    | DB9.75/20  | Wau 6SR         | 6-4 1/2 x 5 1/2                  | BL 607         | U4 3                        | Tim SW310W               | WF             | H 9.25        | 128           | 9 1/4 x 3 1/2  | B                    |
| 30          | 1000              | 4R                       | 8-10                  | 7950          | 196                | 208                  | 40000                | 12600                  | B9.75/24    | DB9.75/24  | Wau 6AB         | 6-4 1/2 x 5 1/2                  | BL 714         | U4 3                        | Tim SW310W               | WF             | H 9.25        | 128           | 9 1/4 x 3 1/2  | B                    |
| 31          | 1000              | 4R                       | 8-10                  | 7950          | 196                | 208                  | 40000                | 12600                  | B9.75/24    | DB9.75/24  | Wau 6AB         | 6-4 1/2 x 5 1/2                  | BL 714         | U4 3                        | Tim SW310W               | WF             | H 9.25        | 128           | 9 1/4 x 3 1/2  | B                    |
| 32          | 1200              | 4R                       | 10-12                 | 8500          | 196                | 208                  | 40000                | 14000                  | B9.75/24    | DB9.75/24  | Wau 6RB         | 6-5 1/2 x 6                      | BL 714         | U4 3                        | Tim SW410W               | WF             | H 9.25        | 128           | 9 1/4 x 3 1/2  | B                    |
| 33          | 1200D             | 10-12                    | 10-12                 | 9750          | 196                | 208                  | 40000                | 14000                  | B9.75/24    | DB9.75/24  | Cum.Die.H6      | 6-4 1/2 x 5 1/2                  | BL 735         | U5 No                       | Tim SW410W               | WF             | H 7.6         | 47.6          | 8 1/2 x 3 1/2  | B                    |
| 34          | Maack BX          | 4R                       | 8                     | 8150          | 178                | 207                  | 20000                | 12000                  | B8.25/22    | DB8.25/22  | Ow BX           | 6-4 1/2 x 5 1/2                  | Ow BX          | U4 No                       | Ow BX6                   | 2F             | A 6.53        | 46.0          | 9 1/4 x 3 1/2  | C                    |
| 35          | BQ                | 4R                       | 8                     | 9350          | 224                | 248                  | 20000                | 15000                  | B9.75/22    | DB9.75/22  | Ow BX           | 6-4 1/2 x 5 1/2                  | Ow BX          | A 4 No                      | Ow BX6                   | 2F             | R 6.54        | 41.9          | 10 1/2 x 3 1/2 | C                    |
| 36          | AC                | 4R                       | 8-15                  | 8500          | 217                | 257                  | 20000                | 14550                  | P40x8       | DP40x8     | Ow BQ           | 6-4 1/2 x 5 1/2                  | Ow AC          | J 4 No                      | Ow AC                    | CD             | R 9.26        | 59.4          | 8 1/2 x 3 1/2  | C                    |
| 37          | AK                | 4R                       | 8-15                  | 9000          | 217                | 257                  | 20000                | 14550                  | P40x8       | DP40x8     | Ow BQ           | 6-4 1/2 x 5 1/2                  | Ow AC          | J 4 No                      | Ow AC                    | CD             | R 9.26        | 59.4          | 8 1/2 x 3 1/2  | C                    |
| 38          | AP                | 4R                       | 8-15                  | 10500         | 217                | 257                  | 20000                | 15900                  | B9.75/22    | DB9.75/22  | Ow AP           | 6-5 1/2 x 6                      | Ow AC          | J 4 No                      | Ow AC                    | CD             | R 9.26        | 59.4          | 8 1/2 x 3 1/2  | C                    |
| 39          | AP                | 4R                       | 8-15                  | 11000         | 217                | 257                  | 20000                | 16400                  | B9.75/22    | DB9.75/22  | Ow AP           | 6-5 1/2 x 6                      | Ow AC          | J 4 No                      | Ow AC                    | CD             | R 9.26        | 59.4          | 8 1/2 x 3 1/2  | C                    |
| 40          | Mar-Her TH310A-10 | 6                        | 10                    | 10000         | 193                | 229                  | 37070                | 14070                  | B9.75/22    | DB9.75/22  | Her RXC         | 6-4 1/2 x 5 1/2                  | Fu 5A530       | U5 A 3                      | Ow Wls                   | 2F             | R 9.11        | 163           | 8 1/2 x 3 1/2  | P                    |
| 41          | (13) TH315        | 6                        | 12                    | 12500         | 198                | 234                  | 42420                | 15420                  | B9.75/22    | DB9.75/22  | Her HXB         | 6-5 1/2 x 6                      | BL 724         | U4 A 3                      | Ow Wls                   | 2F             | R 9.11        | 163           | 8 1/2 x 3 1/2  | P                    |
| 42          | (13) TH320        | 6                        | 15                    | 15000         | 225                | 255                  | 51900                | 18900                  | B10.50/24   | DB10.50/24 | Her HXC         | 6-5 1/2 x 6                      | BL 724         | U4 A 3                      | Ow Wls                   | 2F             | R 9.11        | 163           | 8 1/2 x 3 1/2  | P                    |
| 43          | (13) TH330        | 6                        | 20                    | 17500         | 225                | 255                  | 64100                | 20100                  | B12.75/20   | DB12.75/20 | Her HXC         | 6-5 1/2 x 6                      | BL 724         | U4 A 3                      | Ow Wls                   | 2F             | R 9.11        | 163           | 8 1/2 x 3 1/2  | P                    |
| 44          | Moreland RA-15    | 2C                       | 10                    | 1550          | 149                | Op                   | 20000                | 5300                   | B6.50/20    | DB6.50/20  | Her JXC         | 6-3 3/4 x 4 1/4                  | BL 224         | U4 No                       | Tim SBT75                | SF             | R 5.66        | 35.07         | 7 1/2 x 3 1/2  | T                    |
| 45          | RA20              | 2C                       | 10                    | 1981          | 149                | Op                   | 20000                | 6100                   | P32x6       | DP32x6     | Her JXC         | 6-3 3/4 x 4 1/4                  | BL 224         | U4 No                       | Tim SBT151               | SF             | R 6.17        | 38.27         | 7 1/2 x 3 1/2  | T                    |
| 46          | BD21M             | 4C                       | 10                    | 3534          | 184                | Op                   | 21000                | 8300                   | B7.50/20    | DB7.50/20  | Her WXC         | 6-4 1/2 x 5 1/2                  | BL 334         | U4 No                       | Tim 64800                | WF             | R 6.40        | 39.69         | 9 1/4 x 3 1/2  | T                    |
| 47          | ED25M             | 4C                       | 10                    | 4067          | 184                | Op                   | 25000                | 8900                   | B8.25/20    | DB8.25/20  | Her WXC3        | 6-4 1/2 x 5 1/2                  | BL 334         | U4 No                       | Tim 65000                | W              | R 7.50        | 46.09         | 9 1/4 x 3 1/2  | T                    |
| 48          | HD34M             | 4C                       | 10                    | 5889          | 220                | Op                   | 34000                | 11000                  | B9.00/20    | DB9.00/20  | Her RXB         | 6-4 1/2 x 5 1/2                  | BL 524         | U4 No                       | Tim 65720                | W              | R 8.50        | 62.09         | 9 1/4 x 3 1/2  | T                    |
| 49          | TD34              | 4C                       | 10                    | 7607          | 221                | Op                   | 34000                | 13250                  | B9.75/20    | DB9.75/20  | Con 16H         | 6-4 1/2 x 5 1/2                  | BL 724         | U4 No                       | Tim 68720W               | WF             | R 7.75        | 55.0          | 10 1/2 x 3 1/2 | T                    |
| 50          | Sterling FBT152   | 2R                       | 8 1/2                 | 4580          | 174                | 204                  | 30400                | 9700                   | B9.00/20    | DB9.00/20  | Wau 6-110       | 6-4 1/2 x 5 1/2                  | Ow UC7         | U5 No                       | Ow                       | BF             | R 9.0         | 52.7          | 10 1/2 x 3 1/2 | L                    |
| 51          | FDT152            | 2R                       | 8 1/2                 | 4705          | 174                | 204                  | 30400                | 9700                   | B9.00/20    | DB9.00/20  | Wau 6-110       | 6-4 1/2 x 5 1/2                  | Ow UC7         | U5 No                       | Ow                       | BF             | R 9.0         | 52.7          | 10 1/2 x 3 1/2 | L                    |
| 52          | FDS180            | 4R                       | 8-10                  | 8925          | 158                | Op                   | 36000                | 12850                  | P40x8       | DP40x8     | Wau AB          | 6-4 1/2 x 5 1/2                  |                |                             |                          |                |               |               |                |                      |

| Line Number | ENGINE DETAILS      |                   |                |                     |                                 |                   |                |                 |               |                    | FUEL SYST. | ELEC-TRICAL | FRONT AXLE | BRAKES        |                  |           | BODY MOUNT-ING DATA  |                         | SPRINGS              |               | Auxiliary Type |                |                |                    |                           |             |                     |                      |                  |                |                |          |               |   |
|-------------|---------------------|-------------------|----------------|---------------------|---------------------------------|-------------------|----------------|-----------------|---------------|--------------------|------------|-------------|------------|---------------|------------------|-----------|----------------------|-------------------------|----------------------|---------------|----------------|----------------|----------------|--------------------|---------------------------|-------------|---------------------|----------------------|------------------|----------------|----------------|----------|---------------|---|
|             | Piston Displacement | Compression Ratio | Torque lb. ft. | N.A.C.C. Rated H.P. | Max. Brake H.P. at R.P.M. Given | Valve Arrangement | Camshaft Drive | Piston Material | MAIN BEARINGS | Oiling System Type |            |             |            | Governor Make | Carburetors Make | Fuel Feed | Ignition System Make | Generator, Starter Make | Clutch Type and Make | Radiator Make |                | Universal Make | Make and Model | Steering Gear Make | SERVICE                   |             | Hand Location, Type | Cab to Rear of Frame | Cab to Rear Axle | Width of Frame | Front          | Rear     |               |   |
|             |                     |                   |                |                     |                                 |                   |                |                 |               |                    |            |             |            |               |                  |           |                      |                         |                      |               |                |                |                |                    | Make, Location, Operation | Lining Area |                     |                      |                  |                |                |          | Drum Material |   |
| 1525        | 4.5                 | 380               | 48.6           | 128-2100            | H                               | C                 | A              | 7-2 1/2         | 14            | FP                 | Ha         | Str         | M          | DR            | DR               | dp.Ow     | Lo                   | Spl                     | Ow                   | Jac           | B61A           | 817            | a              | TX                 | 161                       | 100         | 34 1/2              | 50x3 1/2             | 45x4             | N              |                |          |               |   |
| 2616        | 4.5                 | 450               | 57.0           | 149-3100            | H                               | L                 | G              | A               | 7-2 1/2       | 14                 | FP         | Ha          | Str        | M             | DR               | DR        | dp.Ow                | Lo                      | Spl                  | Jac           | B61A           | 965            | a              | TX                 | 161                       | 100         | 34 1/2              | 50x3 1/2             | 45x4             | N              |                |          |               |   |
| 3282        | 5.3                 | 186               | 33.7           | 73-2800             | H                               | L                 | G              | A               | 7-2 1/2       | 10                 | PC         | No          | Str        | M             | AL               | AL        | P                    | BL                      | Yo                   | Spl           | Tim            | 31020          | Ros            | L61HV              | 559                       | G           | TX                  | 140                  | 83               | 34             | 37x2 1/2       | 52x4     | N             |   |
| 4282        | 5.3                 | 186               | 33.7           | 73-2800             | H                               | L                 | G              | A               | 7-2 1/2       | 10                 | PC         | No          | Str        | M             | AL               | AL        | P                    | BL                      | Yo                   | Spl           | Tim            | 31020          | Ros            | L61HV              | 459                       | G           | TX                  | 140                  | 83               | 34             | 37x2 1/2       | 44x3     | N             |   |
| 4284        | 4.4                 | 283               | 45.9           | 94-2200             | H                               | L                 | G              | A               | 7-3           | 14                 | PC         | Ha          | Str        | M             | AL               | AL        | P                    | BL                      | Yo                   | Spl           | Shu            | 5582B          | Ros            | L61HV              | 625                       | G           | CD                  | 168                  | 101              | 34 1/2         | 40x2 1/2       | 52x4     | N             |   |
| 6284        | 4.4                 | 283               | 45.9           | 94-2200             | H                               | L                 | G              | A               | 7-3           | 14                 | PC         | Ha          | Str        | M             | AL               | AL        | P                    | BL                      | Yo                   | Spl           | Shu            | 5582B          | Ros            | L61HV              | 625                       | G           | CD                  | 168                  | 101              | 34 1/2         | 40x2 1/2       | 52x4     | N             |   |
| 7282        | 5.4                 | 176               | 33.8           | 73-2800             | H                               | L                 | G              | A               | 7-2 1/2       | 10                 | PC         | Ha          | Opt        | Str           | M                | AL        | AL                   | P                       | BL                   | Yo            | Spl            | Wis            | ...            | Ros                | L41H                      | ...         | G                   | CD                   | 92               | 56             | 34             | 37x2 1/2 | 54x2 1/2      | N |
| 8298        | 4.7                 | 190               | 33.7           | 70-2600             | H                               | L                 | G              | A               | 7-2 1/2       | 13                 | PC         | Ha          | Str        | M             | AL               | AL        | P                    | BL                      | Yo                   | Spl           | Wis            | ...            | Ros            | L41H               | ...                       | G           | CD                  | 92                   | 56               | 34             | 37x2 1/2       | 54x2 1/2 | N             |   |
| 9361        | 4.7                 | 235               | 38.4           | 82-2400             | H                               | L                 | G              | A               | 7-2 1/2       | 13                 | PC         | Ha          | Str        | M             | AL               | AL        | P                    | BL                      | Yo                   | Spl           | Wis            | ...            | Ros            | L41H               | ...                       | G           | CD                  | 92                   | 56               | 34             | 37x2 1/2       | 54x2 1/2 | N             |   |
| 10501       | 5.0                 | 330               | 48.6           | 110-2200            | H                               | L                 | G              | A               | 7-3           | 12                 | PC         | Ha          | Str        | M             | AL               | AL        | P                    | BL                      | Yo                   | Spl           | Wis            | ...            | Ros            | L41HV              | ...                       | G           | CD                  | 108                  | 73 1/2           | 34             | 39 1/2 x 2 1/2 | 54x3     | N             |   |
| 11428       | 4.5                 | 283               | 45.9           | 94-2200             | H                               | L                 | G              | A               | 7-3           | 14                 | PC         | Ha          | Str        | M             | AL               | AL        | P                    | BL                      | Yo                   | Spl           | Wis            | ...            | Ros            | L41HV              | ...                       | G           | CD                  | 120                  | 72               | 34             | 44x3           | 50x4     | N             |   |
| 12529       | 4.9                 | 350               | 51.3           | 115-2200            | H                               | L                 | G              | A               | 7-3           | 12                 | PC         | Ha          | Str        | M             | AL               | AL        | P                    | BL                      | Yo                   | Spl           | Wis            | ...            | Ros            | L41HV              | ...                       | G           | CD                  | 142                  | 87 1/2           | 34             | 44x3           | 52x4     | N             |   |
| 13707       | 4.5                 | 455               | 60.0           | 148-2000            | H                               | L                 | G              | A               | 7-3           | 17                 | 17         | PC          | Ha         | Str           | M                | AL        | AL                   | P                       | BL                   | Yo            | Spl            | Wis            | ...            | Ros                | L41HV                     | ...         | G                   | CD                   | 144              | 88             | 34             | 44x3     | 50x4          | N |
| 14779       | 4.5                 | 505               | 66.2           | 163-2000            | H                               | L                 | G              | A               | 7-3           | 17                 | 17         | PC          | Ha         | Str           | M                | AL        | AL                   | P                       | BL                   | Yo            | Spl            | Wis            | ...            | Ros                | W61A                      | ...         | G                   | CD                   | 144              | 88             | 34             | 44x3     | 42x4          | N |
| 15779       | 4.5                 | 505               | 66.2           | 163-2000            | H                               | L                 | G              | A               | 7-3           | 17                 | 17         | PC          | Ha         | Str           | M                | AL        | AL                   | P                       | BL                   | Yo            | Spl            | Wis            | ...            | Ros                | W61A                      | ...         | G                   | CD                   | 168              | 100            | 34             | 44x3     | 50x4          | N |
| 16855       | 4.5                 | 555               | 72.8           | 180-2000            | H                               | L                 | G              | A               | 7-3           | 17                 | 17         | PC          | Ha         | Str           | M                | AL        | AL                   | P                       | BL                   | Yo            | Spl            | Wis            | ...            | Ros                | W61A                      | ...         | G                   | CD                   | 168              | 100            | 34             | 44x3     | 50x4          | N |
| 17282       | 4.7                 | 176               | 33.7           | 73-2700             | H                               | L                 | G              | A               | 7-2 1/2       | 10                 | FP         | No          | Zen        | M             | DR               | DR        | P                    | BL                      | Pe                   | Spl           | Tim            | 31000H         | Ros            | L61HV              | 536                       | a           | TX                  | 168                  | 102              | 31 1/2         | 38x2 1/2       | 52x4     | N             |   |
| 18361       | 4.4                 | 235               | 40.8           | 83-2400             | H                               | L                 | G              | A               | 7-2 1/2       | 13                 | FP         | No          | Zen        | M             | DR               | DR        | P                    | BL                      | Pe                   | Spl           | Tim            | 33000H         | Ros            | L61HV              | 536                       | a           | FD                  | 168                  | 102              | 31 1/2         | 38x2 1/2       | 52x4     | N             |   |
| 19393       | 4.9                 | 260               | 62.1           | 103-2600            | L                               | G                 | A              | C               | 7-3           | 11 1/2             | FP         | No          | Zen        | M             | DR               | DR        | P                    | BL                      | Pe                   | Spl           | Tim            | 33000H         | Ros            | L61HV              | 654                       | a           | FD                  | 168                  | 102              | 31 1/2         | 38x2 1/2       | 52x4     | N             |   |
| 20453       | 4.7                 | 300               | 48.6           | 98-2200             | H                               | L                 | G              | A               | 7-3           | 14                 | CC         | Ha          | Zen        | M             | DR               | DR        | P                    | BL                      | Pe                   | Spl           | Tim            | 35000N         | Ros            | W41A               | 815                       | a           | FD                  | 192                  | 120              | 33 1/2         | 42x3           | 56x4     | N             |   |
| 21501       | 4.9                 | 330               | 48.6           | 110-2200            | H                               | L                 | G              | A               | 7-3           | 12                 | CC         | Ha          | Zen        | M             | DR               | DR        | P                    | BL                      | Pe                   | Spl           | Tim            | 36020N         | Ros            | W41A               | 815                       | a           | FD                  | 192                  | 120              | 33 1/2         | 42x3           | 56x4     | N             |   |
| 22498       | 4.4                 | 322               | 53.1           | 125-2400            | H                               | L                 | G              | A               | 7-3 1/2       | 10                 | FP         | No          | Zen        | M             | DR               | DR        | P                    | BL                      | Pe                   | Spl           | Tim            | 36020N         | Ros            | W41A               | 815                       | a           | FD                  | 192                  | 120              | 33 1/2         | 42x3           | 56x4     | N             |   |
| 23638       | 4.3                 | 410               | 54.1           | 126-1850            | H                               | L                 | G              | A               | 7-3 1/2       | 11                 | CC         | Ha          | Zen        | M             | DR               | DR        | P                    | BL                      | Pe                   | Spl           | Tim            | 36020N         | Ros            | W41A               | 815                       | a           | FD                  | 192                  | 120              | 33 1/2         | 42x3           | 56x4     | N             |   |
| 24707       | 4.4                 | 506               | 60.0           | 170-2000            | H                               | L                 | G              | A               | 7-3 1/2       | 11                 | FP         | HS          | Zen        | M             | DR               | DR        | P                    | BL                      | Pe                   | Spl           | Tim            | 36020N         | Ros            | W41A               | 815                       | a           | FD                  | 192                  | 120              | 33 1/2         | 42x3           | 56x4     | N             |   |
| 25707       | 4.4                 | 506               | 60.0           | 170-2000            | H                               | L                 | G              | A               | 7-3 1/2       | 11                 | FP         | HS          | Zen        | M             | DR               | DR        | P                    | BL                      | Pe                   | Spl           | Tim            | 36020N         | Ros            | W41A               | 815                       | a           | FD                  | 192                  | 120              | 33 1/2         | 42x3           | 56x4     | N             |   |
| 26754       | 5.1                 | 1010              | 76.7           | 240-2900            | H                               | L                 | G              | C               | 4-3 1/2       | 10                 | PC         | No          | Zen        | M             | DR               | DR        | dp.Lo                | Ow                      | Blo                  | Tim           | 27450tw        | Ros            | W61A           | 782                | Da                        | CD          | 111 1/2             | 216                  | 34               | 44x3           | None           | N        |               |   |
| 27420       | 5.2                 | 300               | 44.4           | 130-2800            | H                               | L                 | G              | C               | 5-2 1/2       | 12                 | FP         | Ha          | Str        | M             | DR               | DR        | D                    | Fu                      | Ch                   | Spl           | Tim            | 35000H         | Ros            | L61HV              | 525                       | a           | CD                  | 162                  | 108              | 34             | 39x2 1/2       | 39x2 1/2 | N             |   |
| 28420       | 5.2                 | 300               | 44.4           | 130-2800            | H                               | L                 | G              | C               | 5-2 1/2       | 12                 | FP         | Ha          | Str        | M             | DR               | DR        | D                    | Fu                      | Ch                   | Spl           | Tim            | 35000H         | Ros            | L61HV              | 525                       | a           | CD                  | 162                  | 108              | 34             | 39x2 1/2       | 39x2 1/2 | N             |   |
| 29462       | 4.5                 | 300               | 45.9           | 98-2000             | H                               | L                 | G              | A               | 7-3           | 13                 | PC         | Wa          | Str        | M             | AL               | DR        | D                    | Fu                      | Ch                   | Spl           | Tim            | 35000tw        | Ros            | W61A               | 711                       | a           | CD                  | 162                  | 108              | 34             | 39x2 1/2       | 46x3 1/2 | N             |   |
| 30462       | 4.5                 | 300               | 45.9           | 98-2000             | H                               | L                 | G              | A               | 7-3           | 13                 | PC         | Wa          | Str        | M             | AL               | DR        | D                    | Fu                      | Ch                   | Spl           | Tim            | 35000tw        | Ros            | W61A               | 966                       | a           | CD                  | 162                  | 108              | 34             | 39x2 1/2       | 46x3 1/2 | N             |   |
| 31549       | 4.5                 | 332               | 48.6           | 100-2000            | H                               | L                 | G              | A               | 4-3 1/2       | 11                 | PC         | Wa          | Str        | M             | AL               | LN        | D                    | BL                      | Ch                   | Spl           | Tim            | 26045tw        | Ros            | W61A               | 966                       | a           | CD                  | 162                  | 108              | 34             | 48x3 1/2       | 53x4     | N             |   |
| 32677       | 4.6                 | 460               | 60.0           | 127-2000            | H                               | L                 | G              | A               | 4-3 1/2       | 11                 | PC         | Wa          | Str        | M             | AL               | LN        | D                    | BL                      | Ch                   | Spl           | Tim            | 27045tw        | Ros            | W41A               | 792                       | a           | CD                  | 162                  | 108              | 34             | 48x3 1/2       | 53x4     | N             |   |
| 33672       | 1.1                 | 420               | 57.0           | 125-1800            | H                               | L                 | G              | C               | 7-3 1/2       | 16                 | FP         | Ow          | No         | P             | NO               | LN        | dp.BL                | Ch                      | Spl                  | Tim           | 27045tw        | Ros            | W61A           | 966                | a                         | CD          | 162                 | 108                  | 34               | 48x3 1/2       | 53x4           | N        |               |   |
| 34468       | 4.7                 | 292               | 43.4           | 104-2300            | H                               | L                 | G              | C               | 7-3           | 13                 | FP         | Ha          | Str        | M             | NE               | NE        | P                    | Ow                      | Ow                   | Spl           | Ow             | BX             | Ros            | O61A               | 1118                      | a           | FD                  | 192                  | 109              | 33 1/2         | 54 1/2 x 3     | 48x3 1/2 | N             |   |
| 35611       | 5.0                 | 398               | 54.1           | 128-2200            | H                               | L                 | G              | C               | 4-3 1/2       | 11                 | PS         | Ow          | Str        | M             | RB               | LN        | P                    | Ow                      | Ow                   | Cle           | Ow             | BQ             | Ros            | O61A               | 902                       | a           | FD                  | 192                  | 111              | 33 1/2         | 50x3 1/2       | 48x3 1/2 | N             |   |
| 36611       | 5.0                 | 398               | 54.1           | 128-2200            | H                               | L                 | G              | C               | 4-3 1/2       | 11                 | PS         | Ow          | Str        | M             | RB               | LN        | P                    | Ow                      | Ow                   | Cle           | Ow             | BQ             | Ros            | O61A               | 1052                      | a           | FD                  | 180                  | 109              | 37 1/2         | 48x3 1/2       | 52x4     | N             |   |
| 37611       | 5.0                 | 398               | 54.1           | 128-2200            | H                               | L                 | G              | C               | 4-3 1/2       | 11                 | PS         | Ow          | Str        | M             | RB               | LN        | P                    | Ow                      | Ow                   | Cle           | Ow             | BQ             | Ros            | O61A               | 1044                      | a           | FD                  | 180                  | 109              | 37 1/2         | 48x3 1/2       | 52x4     | N             |   |
| 38706       | 4.8                 | 427               | 60.0           | 138-1900            | H                               | L                 | G              | S               | 4-3 1/2       | 11                 | PS         | Ow          | Str        | G             | RB               | LN        | P                    | Ow                      | Ow                   | Cle           | Ow             | BQ             | Ros            | O61A               | 1052                      | a           | FD                  | 180                  | 109              | 37 1/2         | 48x3 1/2       | 52x4     | N             |   |
| 39706       | 4.8                 | 427               | 60.0           | 138-1900            | H                               | L                 | G              | S               | 4-3 1/2       | 11                 | PS         | Ow          | Str        | G             | RB               | LN        | P                    | Ow                      | Ow                   | Cle           | Ow             | BQ             | Ros            | O61A               | 1044                      | a           | FD                  | 180                  | 109              | 37 1/2         | 48x3 1/2       | 52x4     | N             |   |
| 40529       | 4.9                 | 350               | 51.3           | 114-2200            | H                               | L                 | G              | A               | 7-3           | 14                 | PC         | Ha          | Zen        | M             | DR               | DR        | D                    | Ow                      | Ow                   | Blo           | Ow             | W-1s           | Ros            | W41A/61A           | 1836                      | a           | FD                  | 152                  | 102              | 34             | 44x3           | 46x4     | N             |   |
| 41707       | 4.5                 | 460               | 60.0           | 150-2000            | H                               | L                 | G              | A               | 7-3 1/2       | 17                 | PC         | Ha          | Zen        | M             | DR               | DR        | dp.BL                | Yo                      | Blo                  | Ow            | W-1s           | Ros            | W41A/61A       | 1836               | a                         | FD          | 174                 | 102                  | 34               | 44x3           | 46x4           | N        |               |   |
| 42779       | 4.5                 | 508               | 66.2           | 164-2000            | H                               | L                 | G              | A               | 7-3 1/2       | 17                 | PC         | Ha          | Zen        | M             | DR               | DR        | dp.BL                | Yo                      | Blo                  | Ow            | W-1s           | Ros            | W41A/61A       | 1948               | a                         | 2FD         | 223                 | 127                  | 34               | 52x4           | 46x4           | N        |               |   |
| 43855       | 4.5                 | 550               | 72.8           | 180-2000            | H                               | L                 | G              | A               | 7-3 1/2       | 17                 | PC         | Ha          | Zen        | M             | DR               | DR        | dp.BL                | Yo                      | Blo                  | Ow            | W-1s           | Ros            | W41A/61A       | 1948               | a                         | 2FD         | 223                 | 127                  | 34               | 52x4           | 46x4           | N        |               |   |
| 4424        |                     |                   |                |                     |                                 |                   |                |                 |               |                    |            |             |            |               |                  |           |                      |                         |                      |               |                |                |                |                    |                           |             |                     |                      |                  |                |                |          |               |   |



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